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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Chemical Overseas Trade

ALTHOUGH the Board of Trade returns for July show a decline in chemical exports of £430,181 compared with the July figures of 1930 (£2,001,496 to £1,571,315), there are at least two encouraging items in the figures. For the first time this year the actual export figures for one month are in increase over those of the preceding month. Chemical exports in June were £1,282,048; in July they were £1,571,315, an improvement of £289,267. The second favourable point is that the *re-export* figures for the seven months ended July, 1931, have increased by £64,554 over those for the corresponding period of 1930—that is, from £607,397 to £671,951. These, though slight, are welcome signs of possible better times to come. On the other hand, it must be confessed that we have heavy arrears to make up. Compared with the first seven months of 1929, our chemical exports have declined by £4,515,797, and our chemical imports by £2,145,095. Lower prices, as in the case of sulphate of ammonia, may account for part of the decline, but the real explanation is the general state of world trade, on which, of course, the state of chemical industry depends.

Turning to the July export figures, there is no difficulty in locating the weak spots, though here and there one comes upon unexpectedly strong ones. Sulphuric acid—supposed to be the barometer to trade as a whole—is down from £4,264 to £1,703. Tartaric acid has declined from £8,507 to £3,642. Ammonium chloride exports have improved; those of ammonium sulphate have declined from £292,667 to £186,395, the principal losses being in shipments to Spain and the Canaries, Italy and Dutch East Indies. The decline in bleaching powder is from £29,863 to £13,828, in coal tar products from £131,218 to £62,598, in copper sulphate from £116,347 to £44,456. While potassium compounds are down, sodium compounds are up from £298,560 to £337,530, quinine and quinine salts have advanced from £14,212 to £19,671, and dyes and dyestuffs have improved from £93,672 to £101,549, well above the 1929 figure of £95,435. Dyestuffs, indeed, constitute one of the brightest spots, for though we have exported less quantities than in the first seven months of 1929 and 1930, the total value for the seven months of 1931 is higher than that for the corresponding period in either of the previous years—namely, £658,579, against £577,765 in 1930 and £645,359 in 1929. Here we have a clear case of higher export prices for dyes of higher quality. On the import side the most notable item perhaps is an increase of sodium nitrate imports from £20,583 to £38,947.

John William Hinchley

OF the late Professor Hinchley, whose death we announce with sincere regret, it may be said that his supreme claim to remembrance lies in the splendid work he did for the science of chemical engineering in this country. As Professor of Chemical Engineering at the Imperial College of Science and other institutions, he not only taught his students the principles of the science but strove always to make them understand how to apply them in practice to the practical problems awaiting them. Theory was never apart from practice, nor practice from theory. And to both he challenged them to bring the same earnestness and thoroughness that characterised his own work. But his influence as an organiser on behalf of chemical engineering carried his influence far beyond the confines of the class-room or the text-book. He was one of the most active minds in the formation of the Chemical Engineering Group, and at the valuable conferences organised by the group at various centres throughout the country he was a valued helper and contributor. The establishment, a few years later, of the Institution of Chemical Engineers was due to him perhaps more than to any single person. He worked enthusiastically at its constitution, at its examination schemes, at all the organisation involved in its foundation and remarkable growth. He was its honorary secretary up to his death, and the official seal of the Institution, designed by his wife, remains to testify

unconsciously both to his own services and to the help and inspiration that Mrs. Hinchley supplied.

Eager and unsparing as Professor Hinchley's devotion was to his own science, he found time to cultivate wide human interests, and had an inner life of faith and idealism to which only his intimates were admitted. His death when his powers seemed at their ripest closes a creditable career of hard and sincere endeavour and of honourable achievement. He will be remembered as a sincere and successful teacher of a branch of science he had made specially his own, as an unselfish worker with others for the advancement of chemical science, as a good citizen, and as a simple, true and lovable colleague. His services deserve commemoration, and some way may possibly be found of doing this in connection with the interests to which he so generously gave his abilities and strength.

The Nitrate Battle

CLEARLY something is happening behind the scenes in the nitrate industry. There are rumours about a revision of the law relating to the new Chilean organisation known as "Cosach." These lack confirmation so far, and therefore may be excluded. But the recent failure of the Chilean and synthetic producers to reach an agreement already points to a vigorous price war. Germany, the largest synthetic producer as well as the owner of the chief potash supplies, recently imposed a duty of £6 per ton on all imported nitrate, and now nitrate imports into Germany are to be completely prohibited except under licence—the principle that has operated for ten years in our own dyestuffs industry. Poland has also adopted restrictive measures. If, therefore, the Chilean producers introduce competitive cuts in prices, it seems clear that protective measures will be taken in several countries that produce synthetic nitrogen to protect their own markets. Our own latest market report (p. 178) states that the export price of sulphate of ammonia has fallen to £5 2s. 6d., and the home price to £5 10s. The nitrate of soda price for the new season has not yet been announced, and the figure will be awaited with interest.

The Cordite Factory Explosion

THE inquest on the ten men who lost their lives in the recent explosion at the Royal Naval Cordite Factory at Holton Heath, near Wareham, makes it fairly clear, even to the outsider, how the lamentable accident happened. The Admiralty report on the case was only partially disclosed, and their recommendations for obviating the recurrence of such an accident have not been made public, though an assurance was given that these are being carried out. The facts, briefly, are that a workman who had been instructed to empty No. 2 nitrator into an empty "egg," turned on instead the cock of No. 1 nitrator, in which a charge had already been started. This mistake was promptly noticed, and nothing more would have happened if the acid run out from No. 1 nitrator had been left in the "egg," or had been run off. The explosion only occurred in the process of lifting the acid in the "egg" to the chart house.

It is possible that more nitro-glycerine had escaped from No. 1 nitrator than was suspected and that it was only in the process of lifting the acid that the mixture detonated. In any case the Coroner was right in insisting that the explosion was caused not by the workman's original mistake in opening the wrong cock, but in the method adopted to rectify the mistake. The jury's view at first was that no accident would have happened if the wrong cock had not been opened.

Similarly, one might argue that no accident would have happened if no nitrating process had been in progress. But neither the nitrating process nor the opening of the wrong cock was more than a preliminary step to the accident. The explosion was caused during the later step of raising the acid to the chart house, and the precise cause of this can only be matter of conjecture to the outside observer. The manufacture of explosives, many of them extremely sensitive, can never be entirely free from risk by accident, miscalculation, or the presence of some unsuspected factor. The rarity, however, with which serious accidents in such works occur testifies to the remarkably complete chemical control of the processes and to the trustworthiness of the staff employed.

The Third Pittsburg Conference

OWING to what is described in the official circulars as "the desperate plight of the bituminous industry, particularly in America," the third international conference on bituminous coal, to be held at Pittsburg on November 16 to 21, will be mainly directed to the "economic side of the coal business." The largest session of the conference will consider various aspects of high and low temperature distillation, but hydrogenation will also occupy a prominent place on the programme, and other subjects selected for discussion include cleaning and preparation of coal, by-products, fertilisers, flue gas purification, etc. The conference will again be a representative international gathering, the countries represented, in addition to the United States, including Great Britain, Germany, France, Austria, the Netherlands, Belgium, Switzerland, and Czecho-Slovakia. The British delegates are Mr. W. R. Chapman and Dr. F. S. Sinnatt (cleaning and preparation); Messrs. J. Ivon Graham and D. G. Skinner (hydrogenation); Professor A. W. Nash (by-products); Mr. P. C. Pope (low and high temperature carbonisation); Dr. M. Barash, Mr. T. R. Tomlinson, Mr. Gregory M. Gill, Mr. N. E. Rainbush, and Mr. L. H. Sensicle (gasification). Contributions are also announced from Professor W. A. Bone, Dr. E. S. Grumell, Professor H. G. A. Hickling, and Dr. W. H. Cadman.

The Calendar

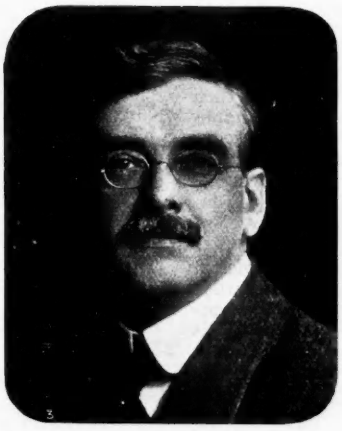
Sept. 6–12	International Association for the Testing of Materials: First Congress.	Zürich.
8–9	Ceramic Society (Building Materials Section): Autumn Meeting.	Leicester.
14–15	Institute of Metals: Annual Autumn Meeting	Zürich.
18–21	Association of Special Libraries and Information Bureaux: Eighth Annual Conference.	Lady Margaret Hall, Oxford.
21–23	Royal Institution: Faraday Celebrations	London.
23–30	British Association Centenary Meeting.	London.
27	Eleventh Congress of Industrial Chemistry.	Paris.
Sept. 29–Oct. 2	Iron and Steel Institute: Autumn Meeting.	Swansea.

The Late Professor Hinchley: Some Appreciations

A Great Worker for Chemical Engineering

We deeply regret to announce the death, which took place in the Freemasons Hospital, London, on Thursday, August 13, in his 61st year, "after a long illness bravely borne," of John William Hinchley, Professor of Chemical Engineering at the Imperial College of Science and Technology, London. The cremation took place at Golders Green on Monday and was attended by a large number of personal friends. Below we give a notice of the late Professor Hinchley's career, together with short appreciations from some who knew and worked with him.

Of the late Professor John William Hinchley, the first occupant of the Chair of Chemical Engineering at the Imperial College of Science and Technology, it may be said at once—indeed, the words might almost serve as his epitaph—that he gave full measure and something more. He was born at Grantham on January 21, 1871. He received his early education at the Lincoln Wesleyan Day School and the Lincoln Grammar School, where he met Canon Fowler whose influence upon the boy extended long after his school days. On leaving school he served an apprenticeship with Ruston Proctor and the Reliance Ironworks, where the foundations of his practical knowledge of engineering were laid under the guidance of his friend, G. W. Keep. About this time he conducted classes in metallurgy at the Lincoln Science School. On winning a National Scholarship and becoming a Whitworth Exhibitioner, he went as a student to the Royal College of Science in London.



Thus early Professor Hinchley's talent for organisation became evident, for on discovering a piece of wood in a rabbit-pie and a nail in a bun, he instigated and conducted a vigorous protest against the food supplied to the students in the refreshment rooms. This resulted in the grant of certain concessions and the ultimate formation of the Students' Union, the government of which is largely in the students' hands. Naturally such an event could not pass unnoticed in any college, and so there appeared in the College magazine a cartoon drawn by the gentle lady of whom it was afterwards jocularly remarked that she jilted the editor and subsequently married the subject of the caricature. Professor Hinchley's interest in this work never waned and at the time of his death he was honorary treasurer of the Union, which he had done so much to create. He also took an active part in the scientific, social and sporting clubs and societies connected with his college.

In 1896, he obtained a Whitworth Scholarship, in the examination for which he was highly placed, and became an Associate of the Royal School of Mines. After occupying the position of demonstrator in his College he went to Dublin for two years as the manager of the National Colour Photography Co., then engaged in the development of the Joly process. His next appointment was on the staff of the well-known explosive expert, Oscar Gutmann, but in 1903 he accepted the position of technical head of the new Siamese Mint at Bangkok. Life in the East interested him greatly and he used to recall with merriment humorous incidents and adventures such as fleeing from a water buffalo in the first motor car seen in Siam, dodging half-tamed elephants in a little oneseor garry, and hunting for a python with a garden hoe.

A College Cartoon.

Returning to this country about 1910 he began, first at Battersea Polytechnic and then at the Imperial College of Science and Technology, the great work of his life—the teaching and development of chemical engineering in this country, and in 1926 he became the first occupant of the Chair of Chemical Engineering in his *Alma Mater*. His lectures were always a happy blend of the practical and theroetical aspects of the subject and were given in such a way that the salient features were firmly impressed upon the minds of the students. In his laboratories he was always devising new pieces of apparatus and new problems for research, and was ever ready with helpful advice, yet ever stressing the fact that the student must think for himself and use his commonsense. He always maintained a keen and sympathetic interest in his students and when they left the College his concern for their welfare did not cease.

In addition to his educational activities Professor Hinchley was always striving to help industry. Shortly after his return to this country he assisted in the formation of the Association of Chemical Technologists, an association that was terminated by the war, and he also took an active part in the creation of the British Association of Chemists. Towards the end of 1918, at his instigation a meeting of those interested in chemical engineering was held in London, which resulted in the formation of the Chemical Engineering Group. He was the first chairman of the Group, and did a great deal towards bringing it into the prominent position it now enjoys. In 1922 he was engaged in the formation of the Institution of Chemical Engineers and since its inception occupied with distinction the position of honorary secretary.

Always prepared to fight strenuously any opposition to his schemes, Professor Hinchley did so without rancour and at the end of the conflict bore no grudge against his opponents. On the social side he founded the Wednesday Club at Nottingham, and the Friday Club in London, with a view of bringing together people of all denominations and classes to discuss art, science, and similar subjects. He was a keen Freemason and one of the founders of both the Radium and Imperial College Lodges, of the latter of which he was a Past Master. A Fellow of the Institute of Chemistry and of the Chemical Society and a member of the Faraday Society, he was recently re-elected to the Council of the Society of Chemical Industry.

Chemical industry in general and chemical engineering in particular have suffered a loss by the death of Professor Hinchley that will long be felt. He is survived by Mrs. Hinchley, who was an art student at the time he was a science student, and whose interest in his varied activities was as keen as his own throughout their long and happy union.

Tributes from Colleagues and Friends

Mr. H. T. Tizard, Rector of the Imperial College of Science and Technology

I have only been closely associated with the late Professor Hinchley since I came to the Imperial College of Science and Technology in 1929. During that short time I learnt greatly to admire his work. The School of Chemical Engineering at the Imperial College is a post-graduate school, and the course occupies one year or, at the most, two years of study. Professor Hinchley never attempted to cram his students with information which they would only gain effectively by long years of experience; he aimed rather at giving them a clear idea of the kind of problems they would meet in practical

life, the difficulties with which they would be confronted, and the way to surmount them. What more can one look for from a short university course of this description? Certainly I had ample opportunity to see its good effects upon his students, who found in him a constant source of inspiration and encouragement, and in whose work and careers he took a sympathetic and affectionate interest.

Professor Hinchley was one of the first to recognise fully the need for a special type of advanced education for "chemical engineers." His active mind was full of plans and hopes for the future; but his work must now be carried on by others. His colleagues and students, past and present, will feel acutely the loss of a loyal friend, and will remember gratefully his devoted and disinterested services to the College.

Professor H. E. Armstrong

As a teacher Professor J. W. Hinchley was unrivalled: he treated his subject with a common sense, a breadth of outlook, and in a practical way, which made his pupils of altogether special value in industry. Used by him, the term chemical engineer had real significance; none of the pretence to attain the impossible that is too often associated with it. His students were made aware of their limitations; above all, he aimed at training them to be thoughtful and use their knowledge. His chief characteristic, however, was his simple, entirely sympathetic, lovable nature. He did immense social service as an organiser. A man of affairs, no mere technical dryasdust, he was ever helpful; indeed, too unsparing of himself in his efforts to aid others.

Mr. Harold Talbot

I was privileged to be in close contact with the late Professor J. W. Hinchley during the last twenty years of his life, when he was laying the foundations and building some of the structure of what will be a lasting monument to his memory—the systematic study as a science and the proper practice as a profession of chemical engineering in this country. I well remember the beginnings of the Chemical Engineering Group of the Society of Chemical Industry—of which he was founder and first chairman—and later of the Institution of Chemical Engineers, of which he was, up to the time of his death, honorary secretary. His unflagging energy, his unwearied enthusiasm, his talent for organisation, and his genius for overcoming difficulties acted as a constant inspiration to his co-workers during those times of initial effort, and the best evidence of the value of his guidance and the worth of his endeavour is to be found in the success of the organisations he called into being.

Apart from his work for the many, in his more intimate and personal relationships the late Professor was a most delightful and helpful friend. He was ever ready to give of his advice, his knowledge, and the benefit of his wide experience. He was a man with the vision of the seer, the tact and diplomacy of the man of affairs, the iron determination of the successful pioneer, and the lovable human qualities of the cherished friend.

"Glad are they whom death finds walking in ways of kindness, or toiling along paths of achievement."

Mr. George Gray, Chairman of the Chemical Engineering Group

To those of us who have but just gained our foothold in the development and progress of Chemical Engineering, the passing of Professor Hinchley leaves a blank which "Father Time" will be long in filling.

During my own association with Professor Hinchley, firstly in connection with the Chemical Engineering Group and latterly, in connection with the Institution of Chemical Engineers, I have been impressed by his kindly smile, by his desire for progress, and by his love of fostering those problems which were so dear to him and so vital to our profession

To the growing generation of chemical engineers I am certain the life and work of Professor Hinchley will serve as an example for many generations to come.

X-Rays in the Textile Industry

By A. J. Hall, B.Sc., F.I.C., F.T.I.

Within the past five years a new weapon for attack on industrial problems has become available to textile technologists and particularly those who deal with cellulosic fibres, such as cotton, linen, and rayon. By means of X-rays it is possible to ascertain much useful information concerning the fine structure of textile fibres. The properties and utility of such fibres and the materials manufactured from them are ultimately dependent on fine structure, so that X-ray methods of investigations will enable important advancements to be made both in manufacturing processes and pure research in textiles. In this article the writer gives an account of this subject to date.

DURING the past thirty years our knowledge of textile fibres has steadily increased in many directions, to the benefit of our textile industries. But throughout that period it was recognised that such fibres as wool, cotton, linen, silk, and ramie were colloidal substances and required special methods of investigation. It is probable that much greater progress would have been made during the same period if the researches then carried out had not been largely dominated by purely chemical considerations. But within the past five years, owing to intensive application of X-ray methods, very rapid advancement has been made in our knowledge of textile fibres, and it appears that the momentum in this new movement is likely to extend this knowledge to a degree hitherto scarcely thought possible.

These new X-ray methods are now no longer the sole rights of the academic researcher; they are almost immediately capable of application to factory processes. It is, therefore, likely that manufacturing methods will soon benefit by application of such methods, and it is hoped that economies in production and the introduction of improved or novel articles of manufacture will result.

The essential point about X-ray investigational methods is that they allow one to obtain very much clearer views of the fine structure of textile fibres than has been possible hitherto by purely chemical methods. Unlike ordinary rays of light, X-rays are able to penetrate matter, and are of extremely small wave-length. As a matter of fact, the average wave length of X-rays is about ten thousand times shorter than that of ordinary light. For this reason it is mechanically impossible to rule a diffraction grating sufficiently finely for use with X-rays. But, nearly twenty years ago, Laue had the idea that if the ultimate particles in a crystal were sufficiently small the fact that they were in orderly array (depending on the type of crystalline form) would cause the crystal to behave as a diffraction grating towards X-rays. This proved to be true in fact, and a technique was gradually evolved whereby the nature of the ultimate particles and their spacing within crystalline substances could be approximately determined by measurement of the diffraction of X-rays allowed to impinge on such crystals. Numerous workers have played a part in the development of these methods including W. H. and W. L. Bragg, H. Mark, Sponler, Meyer, Herzog, Debye, Scherrer and Hull, and those interested in details should consult the publications of these workers.

The ultimate particles of crystalline substances are, of course, built up of atoms, and it has been found possible by X-ray methods to associate the diffraction results with the actual atoms present—their arrangements and spacing. Further, it is not necessary for single crystals to be available for examination; a powder containing crystals is sufficient to provide all the necessary facts. Thus, by examination of a textile fibre, it is possible to secure information indicating the arrangement of the ultimate particles and atoms. Cellulose fibres, particularly cotton and rayons, have so far received most attention, and, in a recent paper dealing with these materials, G. L. Clark (*Ind. and Eng. Chem.*, 1930, **22**, 474) states that from a single X-ray diffraction photograph of cotton or other cellulosic fibre can be deduced the following important facts:—

1. Whether or not the fibre consists of crystals.
2. The type of crystal.
3. Dimensions of the unit crystal cell.
4. The number of $C_6H_{10}O_5$ groups within the unit cell.
5. The location and forces holding the groups within the cell.
6. The dimensions of the crystal or micelle (the units of which the fibre is built up).
7. The lengths of polymerised molecules.
8. The type and degree of orientation of the micelles in relation to the fibre axis.
9. Evidences of physical and chemical change.
10. Structure and deformation of non-fibrous cellulose.

Most natural cellulosic fibres so far examined have proved to be crystalline; they differ mainly as regards the degree of orienta-

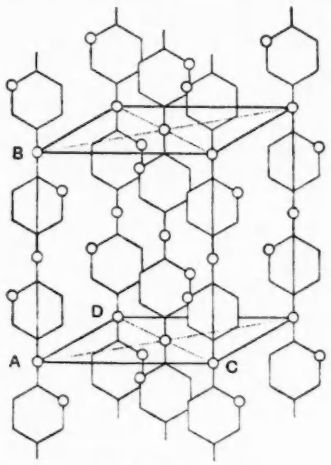


FIG. 1.—CRYSTAL STRUCTURE OF CELLULOSE MICELLE AS REVEALED BY X-RAYS.

tion of their micellæ in relation to the fibre axis. But, before proceding to describe the results of X-ray investigation of cellulosic materials, it will be useful to make quite clear the conception of a micelle.

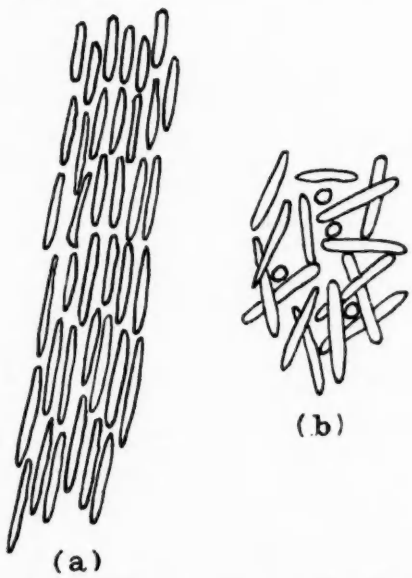


FIG. 2.—(a) MICELLÆ ARRANGED AS IN RAMIE FIBRES.
(b) MICELLÆ ARRANGED AS IN VISCOSE FILM.

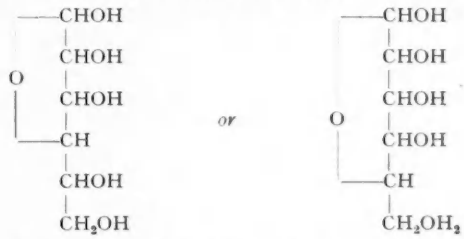
The micelle of cellulose is to be regarded as the unit particle of which the cellulose fibre is built up, and will consist of a number of unit crystal cells. Thus a cotton fibre may be regarded as consisting of an agglomerate of cellulose micellæ.

X-ray methods have revealed that in natural cellulose fibres the micelle may have a length of 150 to 500 A° (1 A° unit = 10^{-8} cm.), and a thickness of about 50 A°. They further reveal that the unit crystal cell of which these micellæ are formed contains four $C_6H_{10}O_5$ groups, or as is preferred, two $C_{12}H_{22}O_{11}$ (cellobiose) groups, and that it has the following dimensions :—

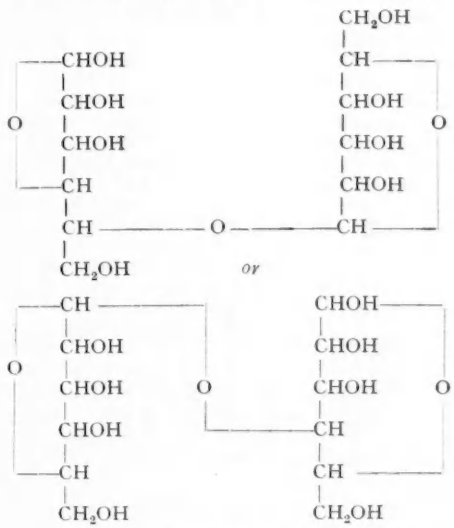
Crystal system : Monoclinic
Axis dimensions : $a=8{\cdot}3$, $b=10{\cdot}3$, $c=7{\cdot}9$.
Crystal angle, β : 84 degrees.
The b axis is in the direction of the fibre or micelle axis.

The spacing between carbon and oxygen atoms in substances other than cellulose is fairly accurately known from other X-ray investigations, and, using these and the results of his own measurements, H. Mark, working in the laboratories of I.G. Farbenindustrie A.-G., has shown that the unit crystal cell of cellulose can be depicted as shown in Fig. 1.

In Fig. 1, it may be noted that AB = 10·3 A°, AC = 8·3 A°, and AD = 7·9 A°; angle CAD = 84 degrees. The hexagons represent anhydro-glucose residues having the formula :—



linked together forming cellobiose residues having the formula



these linkages being by oxygen atoms represented thus :—O—

The micelle of cellulose is thus seen to consist of bundles of chains of anhydro-glucose residues or cellobiose residues, each link in the chains being of the dimensions indicated above.

The orientation of the micellæ can also be determined by X-ray methods and it is this side of the subject which is of immediate practical importance. It is obvious that the micellæ may be arranged at random (Fig. 2b) or uniformly directional (Fig. 2a). In natural fibres such as ramie and cotton, the micellæ appear to be in chains largely along the fibre axis.

Now it is found that fibres have generally a greater tensile strength as the proportion of micellæ oriented parallel to the fibre axis is increased. Thus cotton and ramie fibres are much stronger than ordinary viscose fibres. Under X-ray examination it is revealed that the orientation of the micellæ in the viscose parallel to the fibre axis is much less than in the natural fibres. It will also be remembered that more recently methods have been devised for manufacturing very strong viscose rayons. The method of Lilienfeld is well known and consists of spinning viscose solutions into concentrated sulphuric acid such that a large amount of stretching can be given to the

freshly formed thread. This stretching has the effect of aligning the micellæ parallel to the fibre axis and this accounts for the high tensile strength of Lilienfeld viscose rayon. In some recent investigations on these strong rayons, Mark (*Kunstseide*, 1930, **12**, 218) records the following :—

	Orientation of Micellæ Along Fibre Axis.	Strength in Grams per 100 Denier.
Cuprammonium	Poor	160–180
Ditto	Excellent	over 300
Viscose.....	Poor	150–170
Ditto	Excellent	800

Clark (*Ind. and Eng. Chem.*, 1930, **22**, 485) has recorded some further evidence for the contention that means must be adopted for orienting the micellæ parallel to the fibre axis if high tensile strength is desired in a viscose rayon.

	Orientation of Micellæ along Fibre Axis.	Tensile Strength (grams/denier) Dry.	Wet.
Real silk	Good	2·94	2·54
Ordinary viscose	Poor	1·51	0·79
Lilienfeld silk	Excellent	4·12	2·63
Viscose sewing thread	Very good	2·69	1·45
New viscose silk A	Very good	2·74	1·42
New viscose silk B...	Very good	3·77	2·22

It is also noticed that rayon of high tensile strength as produced by stretching at the time of its formation, has less than the usual degree of extensibility.

The above data suggest that by means of X-ray examination of viscose rayon it is possible to determine the probable tensile strength. Mark points out that such a method will ultimately prove to be the most convenient in rayon manufacture for determining whether or not the conditions of large scale spinning are satisfactory from the strength point of view.

It has been observed previously that X-ray methods allow the determination of micelle size. Now in the chemical treatment of cellulose materials it is almost always found that the action of such substances as acids and oxidising agents affect a lowering of tensile strength and also a lowering of the viscosity of the cellulose when dissolved in cuprammonium solution. The latter fact is interpreted by the assumption that the treatment has resulted in a breaking-up of the micelles into smaller fragments and that the viscosity of a solution of the fragments is lower than a similar solution of the large micellæ. A decrease in tensile strength is thus likely to follow a diminution in micelle size. This can be brought into interesting relationship with the fact noted by Clark (*supra*) that in the process of converting cellulose into viscose rayon the micellæ are appreciably decreased in size. The following data support this :

	Thickness of Micelle.	Length of Micelle.
Ramie cellulose	55A°	600A°
Viscose rayon	41	305

The mercerisation of cotton yarns and fabrics is a very important industrial operation, since by means of this process, cotton can be given a greater permanent lustre and affinity for dyestuffs. What is the effect on the cellulose micellæ of this process as revealed by X-ray methods ? It is a subject which has been investigated by several workers, including Mark, Meyer, Clark, and Bragg.

The X-ray diagrams of cotton show that the micellæ are oriented to some extent, but less than in the case of ramie ; possibly this is because the micellæ chains in cotton are arranged spirally instead of parallel to the fibre axis. When such cotton fibres are immersed in caustic soda of mercerising concentration and then washed free of alkali, without simultaneous stretching, the diagram of the resulting fibres indicates complete absence of orientation of the micellæ. If, however, during the alkali treatment or the washing-out of the alkali the cotton is stretched to counteract the shrinkage which always occurs under such conditions, then the X-ray diagram of the cotton shows the micellæ to be well oriented parallel to the fibre axis. Thus by means of X-rays it is possible to distinguish between cottons which have been mercerised with and without stretching.

There is a further point in connection with the above mercerising treatment which links X-ray diagrams with the dyeing properties of fibres in which the micellæ are well oriented. It is noticed that the cotton mercerised with stretching has less affinity than cotton similarly mercerised without stretching, for direct dyes such as Chlorazol Sky Blue FF. Apparently the affinity of cotton for direct dyes is reduced by better orientation of the micellæ parallel to the fibre axis. This agrees with the results of some investigations of A. J. Hall (*J. Soc. Dyers and Col.*, 1929, **45**, 98) in which it was noted that viscose rayon dyed whilst under a stretching force had a decreased affinity for direct dyes ; it appears likely that the stretching causes a temporary orientation of the micellæ parallel to the fibre axis. The increased creasability of viscose rayon as produced by stretching and recorded by the same investigator (*J. Soc. Dyers and Col.*, 1930, **46**, 258) is also a phenomenon of the same class.

Mark (*Jentgen's Rayon Review*, 1930, **2**, 198) has investigated the X-ray diagrams of both viscose and cellulose acetate rayons under various conditions with interesting results. The X-ray diagrams of cellulose acetate rayon indicates that there is no orientation of the micellæ along the fibre axis, but this effect is produced when the rayon is stretched considerably. If both the non-stretched and stretched rayon threads be then saponified, it is found that the greater orientation of the micellæ in the stretched threads persists through the saponification process.

Accompanying the change of orientation of the micellæ in cotton as produced by mercerisation, there is also a slight change in the unit crystal cell. Clark (*supra*) has drawn attention to this and gives the following data :—

Axis.	Ordinary Cellulose.	Mercerised Cellulose.
a	8·35A°	8·1A°
b	10·3	10·3
c	7·9	9·1
Crystal angle, β	84 degrees	62 degrees

The unit crystal cell retains its original length, but becomes somewhat thicker, this latter change being due apparently to a slight rotation of the cellobiose residues.

There are very many further interesting facts concerning the structure of cotton and rayon fibres as revealed by X-ray methods, but sufficient has been described to indicate the importance of these methods. X-ray investigation is being extended to wool, silk, and other fibres, and it cannot but be anticipated that valuable results will follow. For example, it has already been established that in the weighting of real silk with tin salts the X-ray diagram obtained is a combination of that due to the silk itself, and that of the tin salts ; it is therefore concluded that no combination between the tin and the silk takes place in the weighting operation. On reflection, one can foresee very many applications of X-rays in the textile industries, and the time cannot be far off when those applications will be actually made use of.

British Industries Fair

Buyers in 100 Countries to be Invited to Britain

THE Department of Overseas Trade has despatched to the more distant countries overseas the first of three letters which are to be sent to 55,000 individual buyers in over 100 countries, informing them of the arrangements for the British Industries Fair, which will open in London and Birmingham on February 22. The countries covered by the first despatch are : Australia, New Zealand, China, Fiji, Indo-China, Japan, Persia, Siam, Dutch East Indies, Belgian Congo, Chile and the Philippines. The languages used are English, Dutch, French and Spanish. Nearer countries will be covered by later despatches.

The letter, which is signed by Sir Edward Crowe, Comptroller General, Department of Overseas Trade, states : " You will be interested to know that there are already indications that the coming Fair will be of even greater interest to trade buyers than the last, additional important industries having now indicated their intention of forming sections."

Attention is called to the different closing dates for the various sections of the Fair as follows : London : Olympia, March 2 ; White City (textiles) March 5 ; Birmingham : Castle Bromwich, March 4. The letters are typed on the Fair's new note-headings—a striking design in red and black —which are part of a general scheme this year to improve the official printed matter.

Increasing Trade in Phosphorus

IMPORTS of phosphorus into Great Britain during 1929 were 37,958 cwt., compared with 32,832 cwt. in 1928. Canada was the largest source of supply with 35,975 cwt. and 32,431 cwt. for the corresponding years. The exports of this commodity were 7,796 cwt. in 1929 and 7,349 cwt. in 1928. The exports to Sweden were 3,626 cwt. and 2,967 cwt. for 1929 and 1928 respectively.

Cordite Factory Explosion

Cause of Disaster Revealed

THE inquest on the bodies of the ten men who lost their lives in an explosion in the nitro-glycerine section of the Royal Naval cordite factory at Holton Heath, near Wareham, in June, was concluded on Thursday, August 13. Mr. R. Neville-Jones, the East Dorset coroner, conducted the inquiry, which was held in one of the offices of the factory.

The Findings of the Official Inquiry

Commander Hammond, superintendent of the factory, who was called, corroborated the portions of the Admiralty report of the official inquiry into the cause of the disaster which the Coroner put to him. This report stated that on the morning of the disaster a charge was started in No. 1 nitrator about 7.30. At that time No. 2 nitrator contained waste acid remaining over from the previous day. It was the intention to start a charge in No. 2 nitrator about 10.15, and in order to get it ready the waste acid would require to be run off into the empty "egg" of No. 1. A man named Rogers was looking after No. 2 nitrator and proceeded about 9.15 to make the necessary preparations. He intended to run off the waste acid in No. 2 nitrator, but made a mistake and opened the outward cock of No. 1 nitrator, allowing the acid to run off into No. 1 "egg," a vessel neither intended nor fitted for the purpose. The report added that the probability was so strong that the accident was due to the abnormality caused by the mixing of the acids that there was no necessity to look further. The committee considered that the explosion originated in the waste acid system A.B.C.2, and most probably at the outlet cock from the waste acid tank in the charge house. In their opinion no blame was attributable to anyone. Rogers had made a mistake, but this was not the immediate cause of the explosion. When he realised that he had made a mistake he did his best to rectify it, and informed his superior officer.

Commander Hammond, in reply to Mr. J. W. Miller, who represented the Admiralty, said that, although the output of the factory was reduced from 50 tons to 40 tons, the number of persons employed on the task was not depleted, so that there was no necessity for any pressure. The moral of the staff in the factory on the day of the accident was excellent.

Error in Opening Stop-cocks

Alfred Charles Rogers said that it was his duty to let the waste acid out of No. 2 nitrator and run it into No. 1 waste acid "egg." He went to open the stop-cock of No. 1 waste acid egg and then proceeded with the intention of opening the stop-cock of No. 2 nitrator. By a mistake he opened the stop-cock of No. 1 nitrator. As soon as he got back he discovered his mistake and immediately turned off the stop-cock of No. 1 nitrator. He had previously informed Mr. W. J. Brown, the assistant foreman, who had reported the matter to Mr. E. Norton, the foreman (both victims of the explosion). Mr. Norton inspected the nitrators and expressed the opinion that scarcely any nitro-glycerine had gone. Mr. E. W. Blair, the chemist-in-charge, (another victim), was also informed of what had happened and came along to the section. After seeing Norton they proceeded to make the charge. He (Rogers) was sent to do something else, and on his way back the explosion occurred.

The Coroner: Were you allowed plenty of time for these operations?—Rogers replied that they were and that there was no necessity for any undue haste.

The Coroner, summing up, then said that Rogers had stated quite frankly what happened. If that had not been made clear it would have thrown considerable doubt on the whole system of manufacture of nitro-glycerine. Norton was a man of considerable experience and was due to retire shortly. He had with him other men of very considerable experience. They were all experts, and not one of them thought it sufficiently serious to bring the manager down. They proceeded to deal with the matter in the usual and normal way. They tried to get the waste acid out of this particular egg. There must have been a great deal more nitro-glycerine in the egg than they thought, and when it got thrown up into the chart house the explosion happened. "Whatever Rogers may have done," the Coroner concluded, "there is no doubt about it, his action was not the cause of the explosion. It was in remedying the situation which had occurred owing to his mistake that the explosion took place, and the Committee, after hearing the whole evidence, have come to the conclusion that there is no blame to be attached to anyone."

Disaster due to Method of Remedying Error

The jury having returned after a short retirement, the Foreman said they considered that the ten victims met their death accidentally due to an explosion of nitro-glycerine caused through a mistake. The Coroner said he could not help feeling that that was possibly a little unfair, because whatever mistake was made the evidence of the Committee was quite clear that it was not the mistake which caused the explosion. It was something which was done subsequently to remedy that mistake. He asked them to reconsider their verdict. Eventually, the jury returned a verdict that the ten men met their deaths accidentally owing to an error in the process of manufacturing nitro-glycerine, a rider being added to the effect that no blame was attached to any of the dead men.

Oil from Coal

The Hydrogenation Process in Germany

SIR RICHARD A. S. REDMAYNE has now entered into the controversy concerning the commercial possibility of producing oil from coal, already reported in THE CHEMICAL AGE, August 8 (page 130) and August 15 (page 150). In a letter published in *The Times*, August 18, Professor Redmayne says "everyone who has the welfare of the coal-mining industry at heart must hope that the liquefaction of coal as a commercial proposition may some day be achieved, but unless considerable advances have been made, at Billingham; on German practice—of which I am unaware—that day is not yet." Referring to the statement made by Sir Harry McGowan that, operating on a 15-ton a-day plant, "of the clean, dry coal so treated some 60 per cent. by weight is recorded as refined petrol," he is of the opinion that Sir Harry is in error, as the most that has been claimed hitherto, either in Germany or Britain, is 60 per cent. of crude tar oil—a very different thing.

Yields Obtained from Brown Coal

Regarding the statements which have been made by Professor Donnan, he is in agreement with Professor Brame that it comes as a surprise to fuel experts that 60 per cent. of the coal is converted. "Professor Donnan," he says, "apparently omits from his estimate the quantity of coal involved in the process additional to that subjected to hydrogenation—*e.g.*, the coal required for the production of the hydrogen and for heating the coal treated—which in the aggregate will certainly not be less than another ton. It would be interesting and valuable to know what precisely is the *overall* yield of dehydrated tar secured by the process. I doubt if it exceeds 30 to 35 per cent. Although the yield under the low temperature carbonisation of coal is much lower, say, 10 per cent., whereas under the hydrogenation process the residue is valueless, the residual fuel under the low temperature carbonisation of coal constitutes the chief product, being from 13 cwt. to 15 cwt. of semi-coke.

"Professor Donnan remarks that the Germans produced 100,000 tons per annum of motor spirit from their brown coal by the hydrogenation process. Is not he including in this figure the motor spirit obtained under the low temperature carbonisation of brown coal which has been for so many years extensively practised in Germany? He adds that the German experts are entirely satisfied as to the technical success of the hydrogenation process as applied to brown coal. I understand, however, that it was discovered that the bitumen of the brown coal remained unaffected by the hydrogen. (Bitumen is the constituent in brown coal which, extracted by benzol and refined, is known commercially as montan wax.) Is not Professor Donnan in error also in stating that the yield of tar oil from German brown coal is four times that of bituminous black coal? I can speak with some assurance on the point, having studied the treatment of brown coal in Saxony, and I would say that it is not even twice that obtainable from black bituminous coal. Few manufacturing processes have suffered more from exaggerated anticipation than that of low temperature carbonisation of coal. Let us not repeat the error in the case of the liquefaction of coal."

British Overseas Chemical Trade in July

A Slight Set-back in Exports and Imports

EXPORTS of chemicals, drugs, dyes, and colours during July, as revealed by the Board of Trade returns for British overseas trade, amounted to a total of £1,571,315, which is £430,181 lower than in July, 1930. Imports totalling £973,972 were lower by £125,518, and re-exports, totalling £59,110, were lower by £10,310, as compared with July, 1930.

The statistics for exports and imports during each of the past seven months are set out below, showing percentage fall or rise calculated on figures for the corresponding months of last year. Here it will be seen that the set-back suffered by exports and imports during July has been approximately equal, being 2·5 and 2·6 per cent. respectively, a point which shows that conditions are now far more stable than they were during the earlier months of the year.

	Jan.	Feb.	Mar.	Apr.	May	June	July
Exports ..	—30·5	—40·5	—30·5	—19·4	—15·4	—19·0	—21·5
Imports ..	—22·7	—11·3	—13·2	+ 4·8	—16·4	— 8·8	—11·4

For the first seven months of the present year exports have dropped £3,327,327, and imports have dropped £943,282, below the figures for the corresponding period of 1930.

Imports

	Quantities Month ended July 31.		Value Month ended July 31.	
CHEMICAL MANUFACTURES AND PRODUCTS—	1930.	1931.	1930.	1931.
			£	£
Acetic anhydride ..cwt.	—	562	—	1,054
Acid Acetic .....tons	813	828	32,469	30,220
Acid, Tartaric ....cwt.	3,730	4,377	23,631	21,073
Bleaching materials ,,	5,285	9,842	7,757	14,058
Borax .. .. ,,	17,200	18,683	9,992	11,116
Calcium Carbide	50,300	58,510	28,868	36,187
Coal Tar Products, not elsewhere specified value	—	—	5,675	2,188
Glycerine, Crude...cwt.	490	—	828	—
Glycerine, Distilled. ,,	1,525	1,723	3,578	3,466
Red Lead and Orange Lead .....cwt.	7,965	2,700	11,718	3,617
Nickel Oxide ..... ,,	—	—	—	—
Potassium Nitrate (saltpetre) .....cwt.	7,176	8,418	6,951	7,473
Other Potassium compounds .....cwt.	133,058	71,875	76,398	42,366
Sodium Nitrate.... ,,	41,220	88,530	20,583	38,947
Other Sodium compounds .....cwt.	35,391	34,771	23,499	22,255
Tartar, Cream of... ,,	2,372	1,951	10,759	7,580
Zinc Oxide .....tons	961	636	25,553	13,945
All other sorts....value	—	—	266,014	277,817
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	123,316	87,953	10,780	7,474
Bark Cinchona (Bark Peruvian, etc.) ..cwt.	3,222	1,280	14,749	5,249
All other sorts....value	—	—	149,321	82,814
DYES AND DYESTUFFS—				
Intermediate Coal Tar Products.....cwt.	91	107	1,032	1,097
Alizarine..... ,,	—	—	—	—
Indigo, Synthetic .. ,,	—	—	—	—
Other sorts..... ,,	3,773	4,236	85,961	103,979
EXTRACTS FOR DYEING—				
Cutch .....cwt.	1,858	3,593	3,334	5,636
All other sorts..... ,,	2,165	2,058	6,544	6,404
Indigo, Natural.... ,,	—	27	—	766
Extracts for Tanning (solid or liquid) .cwt.	86,347	81,742	83,998	70,477
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground...cwt.	55,077	45,152	11,679	8,699
White Lead (dry) . ,,	15,280	13,829	24,855	19,189
All other sorts..... ,,	117,997	119,944	152,904	128,220
Total of Chemicals, Drugs, Dyes and Colours .....value	—	—	1,099,490	973,972

Exports

CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid, Sulphuric....cwt.	13,497	1,592	4,264	1,703
Acid, Tartaric .... ,,	1,308	735	8,597	3,642
Ammonium Chloride (muriate) .....tons	363	556	6,602	8,300
Ammonium Sulphate—				
To Spain and Canaries tons	11,921	5,766	92,560	40,175
,, Italy ..... ,,	485	167	4,394	1,093
,, Dutch East Indies tons	2,974	680	24,454	4,978
,, China (including Hong Kong)tons	9,522	8,653	75,399	62,960
,, Japan ..... ,,	1,530	1,502	11,858	11,139
To British West India Islands and British Guiana tons	611	995	4,736	6,952
,, Other Countries ,,	10,821	8,339	79,266	59,098
Total..... ,,	37,894	26,102	292,667	186,395
Bleaching Powder (Chloride of Lime) ...cwt.	106,171	45,537	29,863	13,828
COAL TAR PRODUCTS—				
Anthracene .....cwt.	—	—	—	—
Benzol and Toluol gall.	14,200	192,834	1,285	17,167
Carbolic Acid (crude) ..	Cwt. 1,485	4,640	2,288	458
Carbolic Acid (crystals)	Cwt. 743	1,274	2,803	3,079
Cresylic Acid.....	Gall. 107,589	78,097	12,146	7,845
Naphtha.....gall.	3,055	—	335	—
Naphthalene (excluding Naphthalene Oil) cwt.	3,074	14,899	1,164	3,149
Tar Oil, Creosote Oil, etc. gall.	4,089,806	1,433,537	100,307	23,059
Other sorts.....cwt.	20,099	12,824	10,890	7,841
Total.....value	—	—	131,218	62,598
Copper, Sulphate of ..tons	5,710	2,484	110,347	44,456
Disinfectants, Insecticides, etc. .....cwt.	39,106	27,823	89,175	65,043
Glycerine, Crude ....cwt.	5,744	1,466	10,292	1,573
Glycerine, Distilled . ,,	17,205	10,648	39,946	26,232
Total..... ,,	22,949	12,114	50,238	27,805
POTASSIUM COMPOUNDS—				
Chromate and Bichromate.....cwt.	1,959	1,561	3,985	3,168
Nitrate (Saltpetre). ,,	1,918	1,215	3,560	2,036
All other compounds ,,	5,503	916	17,955	11,917
Total..... ,,	9,380	3,692	25,500	17,121
SODIUM COMPOUNDS—				
Carbonate, including Soda Crystals, Soda Ash and Bicarbonate cwt.	394,031	423,106	113,461	117,167
Caustic ..... ,,	147,126	213,918	99,509	138,090
Chromate and Bichromate.....cwt.	4,552	1,829	6,410	2,959
Sulphate, including Salt Cake .....cwt.	80,417	37,251	10,008	4,929
All Other Compounds cwt.	59,293	68,474	69,172	74,385
Total..... ,,	685,419	744,578	298,560	337,530
Zinc Oxide.....tons	219	584	5,997	12,722
Chemical Manufactures, all other sorts ....value	—	—	304,199	240,429
Total of Chemical Manufactures and Products.....value	—	—	1,363,137	1,021,572
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	124,880	207,926	14,212	19,671
All Other Sorts ..value	—	—	226,906	212,997
Total..... ,,	—	—	241,118	232,668

	Quantities Month ended July 31.		Value Month ended July 31.	
DYES AND DYESTUFFS—	1930.	1931.	1930.	1931.
Products of Coal Tar cwt.	8,191	12,034	87,526	94,663
Other sorts..... ,,	6,194	7,585	6,146	6,886
Total..... ,,	14,385	19,619	93,672	101,549
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground ..cwt.	525	1,635	273	630
White Lead (dry) .. ,,	2,278	2,135	4,307	3,755
Paints and colours in paste form .....cwt.	32,006	23,662	63,614	43,735
Paints and Enamels prepared (including ready mixed) .....cwt.	48,480	34,021	147,399	100,563
All other sorts..... ,,	51,649	38,508	87,976	66,843
Total..... ,,	134,938	99,961	303,569	215,526
Total of Chemicals, Drugs, Dyes and Colours .....value	—	—	2,001,496	1,571,315
Re-exports				
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid, Tartaric ....cwt.	128	75	854	439
Borax ..... ,,	1,342	1,166	893	636
Coal Tar Products, not elsewhere specified value	—	—	16,366	140
Potassium Nitrate (Saltpetre) .....cwt.	79	67	128	80
Sodium Nitrate.... ,,	413	792	206	334
Tartar, Cream of... ,,	400	353	1,820	1,507
All other sorts....value	—	—	17,364	18,788
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	11,091	7,598	1,076	691
Bark Cinchona (Bark Peruvian, etc.) ..cwt.	299	147	2,692	754
All other sorts....value	—	—	23,917	27,189
DYES AND DYESTUFFS—				
Extracts for Dyeing—				
Cutch .....cwt.	151	1,068	231	1,614
All other sorts... ,,	50	175	385	1,177
Indigo, Natural.... ,,	—	7	—	205
Extracts for tanning ,,	892	2,140	1,231	2,704
PAINTERS' COLOURS AND MATERIALS.....cwt.	534	750	1,725	2,192
Total of Chemicals, Drugs, Dyes and Colours....value	—	—	69,420	59,110

Germany and Nitrate

Order Against Imports

A MINISTERIAL order issued by the Acting Minister for Economic Affairs makes the import of nitrate of soda, nitrate of ammonia, ammonium chloride, and all other nitrate-containing fertilisers conditional on an import permit. In effect this is equivalent to a ban on imports of nitrates. An accompanying communiqué says that since the lapse of the international nitrate agreements and the failure of international nitrate negotiations the nitrate market has been thrown into such confusion that the German home market, in consequence of imports at "dumping" prices, is in serious danger, while the continuance of German production and with it the systematic supply of nitrate fertilisers to agriculture is imperilled. The Government, in the present economic depression, feels compelled to follow the example of France, Poland and Czechoslovakia, which have closed their market by import bans.

Sulphuric Acid in Belgium

THE Belgian production of sulphuric acid has nearly doubled since the war. It has risen from 580,000 metric tons in 1913 to 740,000 tons in 1925, 800,000 tons in 1929, and 936,000 tons in 1930. Imports in 1930 were 23,663 metric tons and exports 199,270 tons. The bulk of Belgian sulphuric acid is produced from pyrites, while about one-third is from zinc blende. It is used mainly in the chemical fertiliser industry, of which superphosphate is the most important phase.

Thoughts on Business and Combines

To the Editor of THE CHEMICAL AGE.

SIR,—Just as many people need things as ever: just as many need the work. Business in the old manner was always cowardly. It was afraid of what its opponents were doing. Hence the combine, and instead of doing anything to correct the conditions of business, they kept on talking about business, until there was no business to talk about. In unsound business goods are forced out of the factory for the sake of keeping up the appearance, and it is always possible to stimulate the powers of business of any company to a point where it can be presented before the public as a successful enterprise when really it is failing. It is a natural tendency to do what someone else is doing, and to assume that because that someone else seems to be successful it is safe to follow him.

This is the fallacy of all systems of management which are offered as recipes for success. No one can trade by a system of operation by which a business can be managed at all times. To-morrow, having learnt something, the talk may change. It needs managers instead of systems of management, and managers whose authority is their knowledge, insight, and far reading of the signs of the times, and not ex-officers, etc. Management as a system is the result of accumulated precedence which people establish in their special set of conditions, but conditions have changed and precedence is no longer right.

"Supply cheaply" and not "salesmanship" is the keyword of modern business. Salesmanship is all right up to a certain point, but when it is developed for scheming to get goods into everyone's hands, it comes to an end. Businesses that exist merely to keep a sales force going, at what that force wants to do, and in the manner it wants to do it, may have a merry time for a period, but it comes to a sudden end. A common delusion in salesmanship, is that you are selling against a rival, instead of to the public, and whenever I hear of a business man gravely discussing his competitor, I know he is not managing his own business, but being managed by the effect his competitors have on his mind.

If a business is developed it can have no rivals or competitors, and a business which takes its ideas from other businesses either through fear or emulation and merely keeps them, has nothing which can really be called a foundation. Sometimes I think that the time spent in studying one's competitors is time wasted and may be more profitably spent in studying one's own product and the means of the public, and if we do not know how to better our product one should not be in business.—Yours, etc.,

WALTER S. LLOYD-WILLEY.

"Montrose," 347, Monega Road,
Manor Park, E.12.

European Zinc Cartel

AT a meeting of representatives of the group comprising the International Cartel of Zinc Producers, held in Paris, on Tuesday, August 18, it was reported that the agreement reached at Ostend, on July 11, had been ratified by all the participating countries and had come into operation as from August 1. The object of the agreement is not only to regulate production in such a manner that the present stocks will be speedily absorbed, but to adapt future production to consumption. Production capacity of the countries included in the cartel, which amounts to 1,123,000 tons a year, represents about 97 per cent. of the capacity of European and other producing countries, exclusive of the United States. Stocks in hand in the producing countries other than the United States, on June 1, 1931, totalled 228,000 tons; on July 1, 216,500 tons; and August 1, 206,400 tons.

Australian Imports of Methanol Increase

IMPORTS of methanol into Australia amounted to 49,691 gallons valued at £8,837, in 1929–30, a 30 per cent. increase over the 1928–29 figures of 38,162 gallons, valued at £7,748. The United States was the leading supplier in 1929–30, with 16,204 gallons; Canada, formerly the leading source, was second with 16,153 gallons; Germany, 9,936 gallons; the United Kingdom, 7,398 gallons.

From Week to Week

McGOWRANS, ARGYLL CHEMICAL WORKS, LTD., have taken over the chemical works at Oban, formerly carried on by Mr. J. Boni.

THE GREAT WESTERN RAILWAY have contracted with the Nor-Rust Liquid Lead Co., Ltd., for the coating of approximately 200,000 feet of steel with "Nust," at the docks at Fowey.

THE INSTALLATION OF REFINING PLANT for vegetable oils is contemplated by one of the Cuban vegetable compound factories. Simultaneously the planting of sesame seed by Cuban farmers is being encouraged.

THE SULPHITE CELLULOSE MILLS of the German Waldhof group at Hexholm, Finland, have commenced production. The estimated annual output is 90,000 tons, and there is every possibility of increasing this amount.

ACCORDING to a recent announcement, Champion, Bruce and Co., of London, are making arrangements for the manufacture of white lead in Australia. A representative of the company has arrived in Australia to attend to the preliminary details.

THE WAGES OF WORKERS in the coke oven and by-products industry in South Wales are to be reduced by amounts varying from 6½ to 7 per cent., instead of 20 per cent. as demanded by owners. This was the award of the independent arbitrator issued on Friday last, August 14.

CHAS. PAGE AND CO., LTD., the well-known chemical merchants, hitherto of 37, King William Street, London, E.C.4, have removed their head office to 52, Grosvenor Gardens, S.W.1. Their new telephone number is Sloane 8151 (10 lines); telegraphic address, "Paganini, Sowest, London."

GERMANY'S EXPORTS of tungstic, molybdic, and vanadic acids and salts during 1930 were 358 metric tons valued at £123,000, of which 305 tons went to the United States. Imports amounted to four metric tons. Tungsten, molybdenum, and vanadium for the production of these acids were imported by Germany from China, the United States, and South-west Africa.

OVER 1,000 TONS OF ESPARTO GRASS were destroyed by fire recently in the mills of the Clyde Paper Co., Rutherglen, Glasgow, and damage amounting to £12,000 was caused. Brigades were engaged for five hours fighting the flames. Despite the damage caused by the fire, it is understood that the employment of the workers will not be seriously affected. The cause of the outbreak is attributed to internal spontaneous combustion.

SIR HOLBERRY MENSFORTH has resigned from the board of directors of Dorman, Long and Co., of which he has been a member since the absorption of Bolckow, Vaughan and Co in October, 1929. Sir Holberry, who is a native of Bradford, has held many responsible positions in the industrial world, and about a year ago became chairman of the English Electric Co. In 1926 he was appointed managing director of Bolckow, Vaughan and Co. and undertook the difficult task of reorganising the firm.

CONTINUED COMPLAINTS from woollen manufacturers overseas, regarding the losses caused by the use of tar for branding sheep, are intensifying the search at various experiment farms in New South Wales, to determine the most suitable branding fluids both from the point of view of the sheepman, who must have a brand that remains legible from shearing to shearing, and from the point of view of the manufacturer, who requires a branding fluid which is removable by the ordinary scouring process.

AT THE REQUEST of the Pine Institute of America, chemists of the United States Department of Agriculture are seeking a new material which can be utilised for the manufacture of "cups" for use in gathering turpentine gum. Some of the alloys already tested resist the chemical action of water and turpentine gum to a satisfactory degree, but prove to be too expensive. Such cups, made of 26 gauge plate, would cost about 1s. each, or £500 for a "crop" of 10,000 cups, which is too high at the present prices ruling for turpentine gum. The desirable features of the ideal material are (1) that it will not rust in the presence of water and turpentine gum; (2) that it will not discolour the gum; and (3) that it will be inexpensive.

GERMAN ARTIFICIAL SILK PRODUCERS have by circular letter invited Belgian producers to take part in a cartel, and the Belgian manufacturers will meet shortly to discuss the proposal.

GRAESSER-MONSANTO CHEMICAL WORKS, LTD., are producing special high-boiling cresylic acids of unique character, which give reliable and high co-efficiencies when emulsified, as in disinfectant manufacture.

PATENT RIGHTS have been granted to Thornley, Thomson and Thomas, of Scottish Dyes, Ltd., for the treatment of dyes with alkylating or aralkylating agents to obtain products which are usually faster than the original dyes.

MR. JOHN BOWIE, chairman of the Scottish Dyers and Cleaners Association, has accepted membership of the Scottish National Development Council, a body which has been formed recently for the purpose of promoting Scottish trade.

THE LAST OF THE SHALE at Philpston works has been put through the retorting plant and the plant is damped down for the first time in many years. A number of pumps are being manned in the hope that the mine may be reopened at a later date.

RECENT WILLS include: Mr. George Craig, F.I.C., of Mount Florida, Glasgow, consulting chemist, chemical engineer and analytical chemist, who died on May 5, left personal estate of the total value of £35,426, of which £30,109 is in Great Britain.

PROFESSOR K. A. HOFMANN, head of the chemical department of the Berlin Institute of Technology, claims to have produced a gas which is capable of putting transport engines out of action. It is reported that successful experiments were made during the recent military manœuvres of the Reichswehr.

IT WAS MENTIONED by Mr. R. H. Densham at a meeting of the executive committee of the Devon county branch of the National Farmers' Union last week that a representative of the sulphate of ammonia industry recently met agricultural representatives at the National Farmers' Union headquarters, and that as a result there had been a considerable drop in the price of that product for the forthcoming season. The announcement was received with satisfaction by the members of the committee.

ACCORDING to an Oklahoma City Exchange message, the merger of four large oil companies into a $100,000,000 corporation is imminent, with Mr. Harry F. Sinclair at its head. The new undertaking will be known as the Commonwealth Petroleum Corporation, and will include the Sinclair Consolidated Co., Prairie Oil and Gas Co., Prairie Pipe Line Co., and Tidewater Associated Co. The new corporation will have refineries and pipe-line facilities in every field in the United States, Mexico, Central and South America, Canada, and Africa.

THE DEPARTMENT OF OVERSEAS TRADE announce further changes in the Commercial Diplomatic Service as follows:—Mr. E. Murray Harvey, Commercial Secretary, at Santiago, Chile, to succeed Mr. S. G. Irving as Commercial Secretary, First Grade, at Rio de Janeiro; Mr. A. J. Pack, Commercial Secretary at Washington, to succeed Mr. E. Murray Harvey at Santiago, Chile. These changes are expected to take place early in October. It is anticipated that Mr. Irving will take up his duties as Commercial Counsellor at Buenos Aires about September 17. A further announcement will be made in due course regarding the filling of the Commercial Diplomatic post at Washington to be vacated by Mr. Pack.

Obituary

HENRY JOHN SCOTT STOBART, for many years one of the managing directors of Chance Bros. and Co., Ltd., Spon Lane Glass Works, Smethwick, has died at his residence in South Devon.

JOSEPH OLIVER, who has been associated with the firm of Lofthouse and Saltmer, Ltd., manufacturing and wholesale chemists, at Hull, for more than 40 years, also died suddenly on Sunday, August 16, aged 59.

PROFESSOR W. E. DIXON, F.R.S., died suddenly at Whittlesford, Cambridge, on Sunday last, August 16. He was a distinguished pharmacologist who served the Government and the League of Nations on important committees, chiefly in connection with food preservatives, drugs and ethyl petrol. He was elected F.R.S. in 1911.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

347,989. CYANOGEN HALIDES. Imperial Chemical Industries, Ltd., Millbank, London. International Convention date, August 16, 1929.

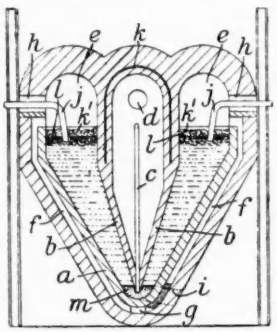
An aqueous solution of hydrocyanic acid is treated with less than the theoretical quantity of halogen at 5–50 lb. per sq. in. in a pressure vessel having an agitator and cooling coils. Chlorination is effected at 20–30 lb. per sq. in. and a temperature below 30° C.

348,000. CATALYSTS FOR SULPHURIC ACID MANUFACTURE. Imperial Chemical Industries, Ltd., Millbank, London. International Convention date, September 13, 1929.

A platinum catalyst is supported on a carrier consisting of asbestos and magnesium sulphate containing also a sulphate of iron, thorium, cerium, barium, tantalum or copper.

348,018. HYDROGEN. T. Lichtenberger, 15, Hohenstaufenstrasse, Stuttgart, and L. Kaiser, 4, Schlossstrasse, Herbede-Ruhr, Germany. International Convention date, July 10, 1929.

Steam is supplied through pipes *c* to a bath *m* of heated iron, and a layer *l* of molten sodium or barium chloride is arranged above the iron, so that the iron oxide produced rises to the surface and is reduced by water gas generated by



348,018

the action of steam supplied through pipes *j*, on coal k^1. The hydrogen produced permeates the walls *b* which are of clay, firebrick, or steel, which are permeable at high temperature, and passes to the outlet *d*. A sheet metal insertion *k* renders the brickwork gastight. The apparatus is heated by burning the excess of coal and water gas and passing the combustion products through the jacket *f*.

348,040. DISPERSING AGENTS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 26, 1929.

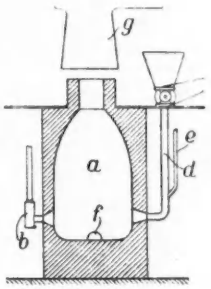
Wetting and dispersing agents are obtained by treating lactic acid freed from water, with octodecyl alcohol while passing a current of nitrogen, and treating the ester with chlorsulphonic acid in the presence of ether. In another case, an ester obtained from hexahydrosalicylic acid and octodecyl alcohol may be sulphonated. Other alcohols may also be used. Reference has been directed by the Comptroller to Specification 315,832.

348,060. RENDERING SALTS NON-CAKING. Patentverwertungs Akt.-Ges, Alfina, 2, Hutgasse, Basle, Switzerland. International Convention date, June, 28, 1929.

Fertiliser salts are converted into coarser grains by the action of pressure in an extrusion press, with or without heating or cooling, followed by a breaking up of the extruded material by the jerky action of the press or by cutting members.

348,138. ANTIMONY OXIDE. Deutsche Schmelz-U. Raffinierwerke Akt.-Ges., and H. H. Grimm, 9, Pockelsstrasse, Gliesmarode, Brunswick, Germany. Application date, February 4, 1930.

Powdered antimony or antimony ore is introduced at *d* into a pear-shaped furnace *a*, by means of preheated compressed air introduced at *e*. Combustible gases or vapours, or coal dust



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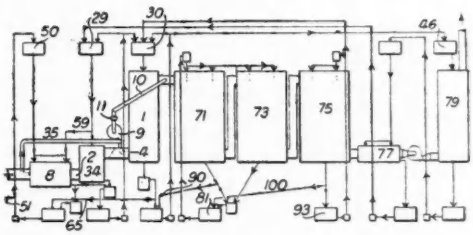
flames are introduced at *b* and the powdered antimony is held in suspension in the hot gases. The finely divided antimony oxide produced is drawn off at *g*.

348,142. SULPHURIC ACID.—E. Rothammel, 81, Maximilianstrasse, Pforzheim, Germany. Application date, February 5, 1930.

Roaster gases pass through a conduit 2 to a denitrator 8 fed with nitrososulphuric acid from tank 50, and the denitrated acid is drawn off. The gases are further nitrated by spraying



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with highly nitrated Gay Lussac acid in a chamber 34 and then pass to a Glover tower 1. The exhaust gases are partly drawn off by exhauster 9 to injector 4 to draw the roaster gases through the apparatus. The Glover tower is fed with acid of 57-58° Bé and yields acid of 60° Bé free from nitroso acid. The slightly nitrated acid from chamber 34 is returned to tanks 29, 30 supplying chamber 34 and tower 1. Part of the Glover tower acid passes to tanks 30, 46 and part by pipe 65 to the dinitrator circuit. The denitrator 8 is then fed with Guy Lussac acid from tank 29. The gases then pass through chambers 71, 73 sprayed with nitrated acid of 58°-60° Bé, and the weak and strong nitrated acid from the two chambers respectively pass to tank 81. The remaining sulphur dioxide is converted in a chamber 75, and the acid passes to tank 81.

347,943 and 348,001. ALKOXYACETALS AND ALKOXYALDEHYDES. A. Wacker Ges. fur Elektrochemische Industrie Ges., 20, Prinzregentenstrasse, Munich, Germany. International Convention dates, July 20, and November 25, 1925.

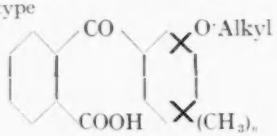
347,943. Alkoxyacetals are produced by the action of three molecules of an alcohol on one molecule of an unsaturated aldehyde and are converted into alkoxyaldehydes by a catalytic partial hydrolysis. Isolation of the acetal is not necessary. The catalyst may be hydrochloric, sulphuric, alkylsulphuric, toluenesulphonic, phosphoric or oxalic acid, and the temperature of hydrolysis 20° to 25° C. Examples relate to the production of ethoxybutyraldehyde from ethoxybutyracetal, and from crotonaldehyde and ethyl alcohol, of methoxybutyraldehyde from crotonaldehyde and methyl

alcohol, and similarly of the butyl, amyl, isoamyl, benzyl, etc., derivatives of oxybutyraldehyde.

348,001. The alkoxyaldehyde is separated rapidly as vapour, *e.g.*, by running the reaction mixture into a fractionating column charged with water and steam or by dropping it into boiling water connected with the column. The degree of hydrolysis is controllable by the use of strongly acid accelerators or alkaline retarding substances.

348,037. Dye Intermediates. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 5, 1930.

Alkoxybenzophenone di- and tri-carboxylic acids are obtained by oxidation with alkaline permanganate of compounds of the type



in which n is 1 or 2 and the benzene nuclei may be further substituted. The starting materials are obtainable by condensation of phthalic anhydride or a derivative thereof, either (1) with an alkyl ether of a cresol or xylenol, or (2) with a cresol or xylenol followed by alkylation of the products by means of a dialkyl sulphate or a *p*-toluenesulphonic acid alkyl ester.

348,047. Acridine Compounds. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 27, 1929. Addition to 328,212. (See The Chemical Age, Vol. XXII, p. 612.)

To obtain double salts of 3 : 6-diamino-10-alkylacridinium bases with 3 : 6-diaminoacridine, the latter is substituted in the amino group by a group adapted to be readily split off, is then alkylated to the extent of 50 per cent., and the substituent group is eliminated. The semi-alkylation is effected in a solvent such as nitrobenzene or dichlorobenzene with an amount of alkylating agent dependent upon the temperature conditions.

348,134. Alkylene Cyanhydrins. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 31, 1930.

Alkylene cyanhydrins are produced by interaction of alkylene oxides with dispersions of cyanides of alkali or alkaline earth metals in hydroxylic solvents such as water or alcohols or mixtures thereof. The temperature for the reaction is conveniently between 10° and 70° C. The cyanide may be regenerated continuously or intermittently by passing hydrocyanic acid into the solution or suspension of hydroxide formed. The products are convertible by hydrolysis into the corresponding hydroxycarboxylic acids. Specified starting materials are ethylene, propylene and butylene oxides, glycide, and epichlorhydrin.

348,159–60. Dyes. S. Thornley, J. Thomas and Scottish Dyes, Ltd., Earl's Road, Grangemouth. Application date, October 31, 1929.

348,159. Vat dyes are obtained by treatment of dibenzanthronyls or their substitution products with hydroxylamine or substances yielding hydroxylamine followed by fusion with alkali. Numerous examples are given.

348,160. The above products are treated with alkylating or aralkylating agents resulting usually in an improved fastness of the dyeings.

348,170. Dyes. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 9, 1930.

The condensation products obtainable by the processes of Specifications 20,527/04 or 343,994 (See The Chemical Age, Vol. XXIV, p. 501) are heated alone or together with inert neutral, acid or weakly alkaline inorganic media or inert organic media. The indanthrone-formaldehyde condensation products so obtained give greener shades than the original materials and may, if desired, be halogenated. Specified media are carbon dioxide, benzophenone, dilute sulphuric acid, phosphoric acid, sodium chloride, water, benzene, nitrobenzene, weak alkalis, alkylamines, cyclohexylamine, di- and tri-ethanolamines, and weak acid salts of the alkali metals. In an example the material is heated alone to 250° C.

348,232. Dyes. W. W. Groves, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 18, 1930.

Substituents are introduced into an aryl nucleus linked to the chromogen in dyestuffs to be used in the bleaching-out process in order to regulate the velocity of bleaching-out. Such introduction may be effected by the use of substituted intermediates in the synthesis of the dyestuffs. The examples relate to dyestuffs of the azine, oxazine, and pyronine series.

348,241. Dye Intermediates. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 20, 1930.

Thiazolanthrone sulphones are produced by oxidation in an acid medium of thiazolanthrones and their nuclear substitution products. In examples, (1) thiazolanthrone, 2-methylthiazolanthrone, and 1 : 5-dithiazolanthrone are oxidized with hydrogen peroxide in glacial acetic acid, (2) thiazolanthrone-2-carboxylic acid is oxidized with chromic acid in glacial acetic acid, and (3) 5-chlorothiazolanthrone (obtained from the 5-amino compound by Sandmeyer's reaction) is oxidized with chlorine in dilute acetic acid.

348,243. Destructive Hydrogenation. H. D. Elkington, London. From Naamlooze Vennootschap Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague, Holland. Application date, February 20, 1930.

Coal, asphalts, petroleum products, tars, phenols, cresols, and like materials are treated with hydrogen or gases supplying hydrogen at elevated temperatures and pressures in presence of catalysts obtainable by treating metal oxides or hydroxides with sulphuretted hydrogen, e.g., at 200–300° C. The preparation of a cobalt oxide catalyst and its use in the production of hydrocarbons from brown coal and crude cresolsare described.

348,248. Catalytic Hydrogenation. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date February 22, 1930.

In the catalytic reduction of crude aldol with hydrogen or gases containing not less than 80 per cent. of hydrogen to obtain 1 : 3-butylene glycol, the first stage is effected at 30–80° C. and the reduction is then completed by the use of higher temperatures, if desired, the mixture being maintained acid throughout the process, preferably by addition of an organic, e.g., acetic, acid. Diluents such as water, aliphatic alcohols, glycols, glycerol, or dioxane may be present. Metals of the first and eighth groups of the periodic system or mixtures thereof may be employed as catalysts, with or without the addition of activators such as platinum. A suitable catalyst is obtained by dissolving basic nickel carbonate in a solution of ammonium carbonate and ammonia, adding a little platinic chloride, soaking granular silica gel in the solution, and reducing with hydrogen at 300° C. In an example a mixture of crude aldol and alcohol, acidified to $p_H = 4{\cdot}8$ with acetic acid, is introduced at the top, heated to about 80° C, of a column in which the reduction is effected under a pressure of 90 atmospheres. The column is charged with a catalyst comprising finely divided copper upon silica gel, and the hydrogen entering the top of the column forces the liquor downwards over the surfaces of the catalyst; the reaction product, after being heated to 120° C. in the lower part of the column is withdrawn at the lower end. The catalyst may be regenerated in the column by drying, oxidizing with air at 250° C., and thereafter reducing the copper oxide with hydrogen.

348,255. Salts of Organic Acids. Imperial Chemical Industries, Ltd., London. Assignees of E. E. Reid, of Baltimore, U.S.A. International Convention date, February 28, 1929.

Alkali salts of carboxylic acids are obtained by the action of caustic alkalis on alcohols at temperatures above 300° C., and pressures above 100 atmospheres. Examples relate to the production of sodium acetate from ethyl alcohol, sodium propionate from propyl alcohol, sodium butyrate from butyl alcohol, and potassium caprylate from octanol.

348,282. Concentrating Aliphatic Acids. Soc. Anon. des Distilleries des Deux-Sèvres, Melle, Deux Sèvres, France. International Convention date, March 19, 1929. Addition to 296,974 (see The Chemical Age, Vol. XIX, p. 466).

Monobasic aliphatic acids, other than acetic acid, are separated from aqueous solution by extraction with a solvent which is insoluble or difficultly soluble in water, boils at a higher

temperature than the acid, and forms no azeotropic mixture therewith, followed by dehydration of the solution with an entrainer forming with water an azeotropic mixture having a minimum boiling point lower than that of the mixture formed by water and the solvent. An accessory liquid forming with the acid a minimum boiling point mixture may be used as described in Specification 317,462 (see THE CHEMICAL AGE, Vol. XXI, p. 362) to separate the solvent from the acid. The examples relate to (1) the extraction of aqueous propionic acid with amyl propionate, dehydration of the extract by distillation with ethyl propionate and separation of the propionic acid from the amylpropionate by distillation with a petroleum fraction boiling at 138–140° C., (2) the extraction of aqueous formic acid with amyl formate, dehydration of the extract with propyl formate, and separation of the formic acid from the amyl formate with n-heptane.

348,283. DYES. Soc. of Chemical Industry in Basle, Basle, Switzerland. International Convention date, March 16, 1929.

In the known process of condensation of amino compounds, e.g., aminoazo dyestuffs, with 4 : 4^1-dinitrostilbene-2 : 2^1-disulphonic acid, 4 : 4^1- dinitrodibenzyl-2 : 2^1-disulphonic acid, or a conversion product of *p*-nitrotoluenesulphonic acid, the reaction is effected under pressure. The products are distinguished by their giving dyeings of deeper tone and of greater fastness to alkalis and to light than the products obtained without the use of pressure; they may be subjected to treatment with oxidizing and/or metallizing agents; alternatively the aminoazo dyestuffs may be metallized before the condensation. Numerous examples are given.

348,345. PYRIDINE AND QUINOLINE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 19, 1929.

N—Methylpyridinium chlorides are obtained by the action of methyl chloride on pyridine or a substitution product thereof, preferably at a raised temperature not above 200° C., under pressure, and in presence of an iron or copper chloride. Suitable diluents are water, ether, benzene, benzine, and tetra- or deca-hydronaphthalene. Examples relate to the treatment of pyridine, α-picoline, β-methoxypyridine, and α : α - dichloropyridine. The Specification as published under Sect. 91(3)(*a*) of the Acts relates also to the production of the corresponding quinolinium compounds.

348,346. DICHLORETHYLENE. Consortium für Elektrochemische Industrie Ges., 20, Zielstattstrasse, Munich, Germany. International Convention date, April 20, 1929.

1 : 1 : 2- Trichlorethane is passed at a high temperature over a heated surface to convert it into a mixture of dichlorethylenes in which the symmetrical compound predominates. The use as catalyst of a salt of copper, iron, or an alkaline earth metal, preferably on a carrier such as pumice or charcoal, facilitates the reaction.

Specifications Accepted with Date of Application

353,861. Two-step sulphatising roasting process. F. A. Brinker. February 18, 1930.

353,863. Dyestuffs from heterocyclic nitrogen compounds, Manufacture of. Imperial Chemical Industries, Ltd., H. A. Piggott, and E. H. Rodd. February 24, 1930.

353,866. Polymerised vinyl alcohols, Manufacture and production of. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*). March 24, 1930.

353,867. Melting flux for purifying aluminium, its alloys, and other non-ferrous metals. F. Dubberley, sen., F. Dubberley, jun., C. A. Dubberley and E. H. Tyson. March 26, 1930.

353,886. Vat dyestuffs of the isodibenzanthrone series containing chlorine and/or bromine, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. April 27, 1929.

353,889. Dyestuffs from heterocyclic nitrogen compounds, Manufacture and application of. Imperial Chemical Industries, Ltd., I. M. Heilbron and F. Irving. January 21, 1930.

353,891. Aluminium alloys, Process for manufacturing. S. Junghans. January 31, 1929.

353,892. Aqueous dispersions or solutions of iodine, Production of. D. McKie and A. Bennett. March 21, 1930.

353,913. Performing endothermic reactions, Process of. T. S. Wheeler, D. Binnie and Imperial Chemical Industries, Ltd. February 26, 1930.

353,921. Salicylic or *o*-cresotinic acid or their salts, Production and purification of. Graesser-Monsanto Chemical Works, Ltd., F. R. Graesser-Thomas, and E. Mather. April 29, 1930.

353,932. Anthraquinone derivatives, Manufacture of. A. G. Bloxam (*Soc. of Chemical Industry in Basle*). April 24, 1930.

353,970. Substances containing sulphur in a chemically active condition. British Thomson-Houston Co., Ltd. May 14, 1929.

354,093. Removal of calcium chloride adhering to calcium hypochlorite. I.G. Farbenindustrie Akt.-Ges. September 17, 1929.

354,096. Photochemical oxidation of organic and inorganic compounds. Dr. I. Kreidl, C. Rosen, and K. Rutter (trading as Vereinigte Chemische Fabriken Kriedl, Heller and Co.). October 19, 1929.

354,098. Conversion of metallic ores. H. Edwards, O. J. Parker, and R. Arnot. September 13, 1930.

354,138. Derivatives of naphthazarin, Manufacture of. I.G. Farbenindustrie Akt.-Ges. November 23, 1929. Addition to 316,950.

354,159. Acetic anhydride, Manufacture of. W. W. Groves (*I.G. Farbenindustrie Akt.-Ges.*). February 6, 1931.

Applications for Patents

[*In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.*]

Ashcroft, E. A. Treatment of ores, etc., containing copper. 22,863. August 13.

—— Production of metal chlorides, etc. 22,864. August 13.

—— Recovery of zinc, etc., from blast furnace slags, ores, calcines, etc. 22,865. August 13.

—— Extraction of precious, etc., metals from ores, etc. 22,866. August 13.

—— Electrolysis of zinc chloride, etc. 22,867. August 13.

—— Elimination of impurities from metal-bearing ores, etc. 22,868. August 13.

Burgess Laboratories, Inc., C. F. Manufacture of ether derivatives of carbohydrates. 23,015. August 14. (United States, August 14, 1930.)

Carpmael, A. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of disinfectants. 23,056. August 15.

(Chemische Fabrik Von Heyden Akt.-Ges.). Manufacture of aromatic oxycarboxylic acids. 22,886. August 13.

Crosfield and Sons, Ltd., J. (Philadelphia Quartz Co. of California, Ltd.). Manufacture of crystallised hydrates of sodium metasilicate. 23,051. August 15.

Durand and Huguenin Akt.-Ges. Producing reserves on variamine blue dyeings by means of ester salts of leuco-vat-dyestuffs. 22,888. August 13. (Germany, August 13, 1930.)

Groves, W. W. (Chemische Fabrik Von Heyden Akt.-Ges.). Manufacture of aromatic oxycarboxylic acids. 22,886. August 13.

Groves, W. W. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of 6-bromo-2-hydroxynaphthalene 4 : 6-dibromo-2-hydroxynaphthalene. 22,572. August 10.

I.G. Farbenindustrie Akt.-Ges., Johnson, J. Y. Apparatus for carrying out processes at elevated temperatures, etc. 22,569. August 10.

—— Coating, etc., surfaces. 22,570. August 10.

I.G. Farbenindustrie Akt.-Ges. Manufacture of 6-bromo-2-hydroxy naphthalene and 4 : 6-dibromo-2-hydroxynaphthalene. 22,572. August 10.

I.G. Farbenindtstrie Akt.-Ges., Johnson, J. Y. Manufacture of assistants for the textile, etc., industries. 22,787. August 12.

—— Manufacture of compounds containing halogens. 22,788. August 12.

I.G. Farbenindustrie Akt.-Ges. Daylight reels for kinematograph films. 22,725. August 11. (United States, August 18, 1930.)

—— Testing evacuated ampoules. 22,729. August 11. (Germany, August 11, 1930).

—— Photographic bleaching-out process. 22,887. August 13. (Germany, August 13, 1930.)

Maruhn, J., and Tübben, L. Apparatus for hydrogenation. 22,612. August 10.

Metallges. Akt.-Ges. Treatment of carbonaceous residues derived from vaporising processes. 22,790. August 12. (Germany, August 13, 1930.)

Metallisation, Ltd. Protecting metals against corrosion. 23,066. August 15.

Monsanto Chemical Works. Manufacture of coumarin. 22,724. August 11. (United States, September 2, 1930.)

Naugatuck Chemical Co. Production of styrol. 22,791. August 12. (United States, August 22, 1930.)

—— Preservation of rubber latex. 22,795. August 12. (United States, August 27, 1930.)

Scott, A. C. Manufacture of explosives. 23,001. August 14.

Soc. of Chemical Industry in Basle. Manufacture of indigoid vat dyestuffs. 22,574. August 10. (Switzerland, August 8, 1930.)

Titanium Pigment Co., Inc. Manufacture of titanium pigments. 22,898. August 13. (United States, August 14, 1930.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£17 15s. per ton d/d address U.K. in casks.
ACID CHROMIC.—11d. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or c.i.f. export
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3¼d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4¼d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3¾d. per lb. ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or c.i.f. export.
SALAMMONIAC.—Firsts lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77° E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3¾d. per lb. d/d U.K., or c.i.f. export.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in drums. Crystals—Spot, £8 5s. per ton, d/d in casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. to 6¼d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 2s. 2d. to 2s. 3d. per gall. Pale, 98%, 1s. 7d. to 1s. 8d. Dark, 1s. 4d. to 1s. 4½d.
ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4¾d. per gall.
BENZOLE.—Prices at works: Crude, 5½d. to 6½d. per gall.; Standard Motor, 1s. to 1s. 1d. per gall. 90%.—1s. 1d. to 1s. 2d. per gall. Pure, 1s. 4d. to 1s 5d. per gall.
TOLUOLE.—90%, 1s. 8d. to 1s. 9d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall.
XYLOL.—1s. 7d. to 1s. 8d. per gall. Pure, 1s. 10d to 1s. 11d. per gall.
CREOSOTE.—Standard specification, for export, 5dd. to 5¼d. net per gall. f.o.b.; for Home, 3¾d. per gall. d/d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.
NAPHTHALENE.—Purified Crystals, £10 per ton.
PITCH.—Medium soft, 52s. 6d. per ton, in bulk at makers' works.
PYRIDINE.—90/140, 3s. to 3s. 3d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—8½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £12 per ton. Liquor, 9d. per gall.
ACETONE.—£63 to £65 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
WOOD TAR.—£4 to £5 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3d. to 4d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4d. to 5½d. per lb.; Dark, 4d. to 4½d. per lb.
LAMP BLACK.—£28 per ton.
LITHOPONE, 30%.—£18 to £20 per ton.
SULPHUR.—£9 10s. to £13 per ton.
SULPHUR CHLORIDE.—4d. to 7d. per lb., according to quality.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
SULPHUR PRECIP. COMMERCIAL.—£40 to £45 per ton.
VERMILION, PALE OR DEEP.—6s. 2d. to 6s. 8d. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4d. to 1s. 6d. per lb.
ACID, ACETIC, PURE, 80%.—£35 5s. per ton d/d address U.K. in casks.
ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.
ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—10½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots; Resublimed, 8s. 6d. per lb. for 28-lb. lots, d/d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—10½d. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 6d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—2s. 10d. per lb.
BISMUTH CARBONATE.—7s. 9d. per lb.
BISMUTH CITRATE.—8s. 7d. per lb.
BISMUTH SALICYLATE.—7s. 11d. per lb.
BISMUTH SUBNITRATE.—6s. 9d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 6d. per lb.
BISMUTH OXIDE.—10s. 9d. per lb.
BISMUTH SUBCHLORIDE.—10s. 5d. per lb.
BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2½d. per lb.; 6 W. Qts., 1s. per lb.; 12 W. Qts., 10½d. per lb.; 36 W. Qts., 10d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
CAFFEIN, PURE.—6s. 6d. per lb.
CAFFEIN CITRAS.—5s. per lb.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.
CAMPHOR.—Refined flowers, 2s. 8d. to 2s. 10d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.
CHLOROFORM.—2s. 4d. per lb.
ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—4s. 7d. per lb. in 1-lb. lots; 3s. 5¾d. per lb. in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz.
MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 14s. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 9s. 9d. per lb., according to quantity; Liquid (95%), 8s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 7s 4d. to 7s. 5d. per lb., levig., 6s. 11d. to 7s. per lb.; Corrosive Sublimate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 3d. to 5s. 4d. per lb.; White Precipitate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 11d. to 6s. per lb.; Calomel, 6s. 3d. to 6s. 4d. per lb.; Yellow Oxide, 6s. 9d. to 6s. 10d. per lb.; Persulph, B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 6s. 5d. to 6s. 6d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 4d. per lb.
PARAFORMALDEHYDE.—1s. 6d. per lb.
PARALDEHYDE.—1s. 1d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—77s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
POTASSIUM METABISULPHITE.—50s. per cwt. d/dLondon, kegs free.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.
SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 6d. to 1s. 7½d. per lb.
SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb. for 28-lb. lots.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.
STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.
ZINC STEARATE.—1s. 4d. to 1s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—8s. 9d. per lb.
AMYL ACETATE.—2s. 3d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL CINNAMIC ALDEHYDE.—8s. 6d. per lb.
AMYL SALICYLATE.—2s. 6d. per lb
ANETHOL (M.P. 21/22° C.).—5s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE ALCOHOL.—1s. 3d per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.
BENZYL BENZOATE.—2s. 2d. per lb.
CINNAMIC ALDEHYDE NATURAL.—11s. 9d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—7s. 3d. per lb.
CITRAL.—6s. per lb.
ETHYL CINNAMATE.—6s. 9d. per lb.
ETHYL PHTHALATE.—2s. 6d. per lb.
EUGENOL.—7s. 6d. per lb.
GERANIOL.—6s. to 10s. per lb.
GERANIOL (FROM PALMAROSA).—14s. per lb.
HELIOTROPINE.—5s. 6d. per lb.
ISO EUGENOL.—9s. per lb.
LINALOL (EX BOIS DE ROSE).—5s. 6d. per lb.
LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.
METHYL ANTHRANILATE.—6s. per lb.
METHYL BENZOATE.—4s. 3d. per lb.
MUSK XYLOL.—6s. 6d. per lb.
PHENYL ETHYL ACETATE.—10s. per lb.
PHENYL ETHYL ALCOHOL.—8s. 3d. per lb
RHODINOL.—40s. per lb.
SAFROL—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.
BERGAMOT OIL.—8s. 6d. per lb.
BOURBON GERANIUM OIL.—17s. 6d. per lb.
CAMPHOR OIL.—White, 100s. per cwt.; Brown, 100s. per cwt.
CANANGA.—Java, 7s. per lb.
CINNAMON OIL LEAF.—4s. per oz.
CITRONELLA OIL.—Java, 2s. 6d. per lb., c.i.f. Pure Ceylon, 2s. per lb.
CLOVE OIL, 90/92%.—6s. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%—1s. 4d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.
LEMON OIL.—4s. 3d. per lb.
LEMONGRASS OIL.—2s. 9d. per lb.
ORANGE, SWEET.—8s. per lb.
OTTO OF ROSE.—Anatolian, 40s. per oz.; Bulgarian, 60s. per oz.
PALMA ROSA.—8s. 9d. per lb.
PETITGRAIN.—5s. 9d. per lb.
SANDALWOOD.—Mysore, 28s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, August 19, 1931.

NOTWITHSTANDING the holidays there has been a fair amount of enquiry and business transacted during the current week. Prices on the whole remain steady.

General Chemicals

ACETONE.—£60/63 per ton according to quantity, steady demand.

ACID ACETIC is unchanged at £34 5s. to £36 5s. per ton for technical 80% and £35 5s. to £37 5s. per ton for pure 80%, with a good steady demand.

ACID FORMIC is in steady request at £37 per ton.

ACID CITRIC is somewhat slow at about 10½d. per lb.

ACID LACTIC is unchanged at £38 per ton for 50% by weight.

ACID OXALIC is firm at £34 per ton in casks and £35 per ton in 1 cwt. kegs, carriage paid, with a good demand.

ACID TARTARIC is quiet at about 10¾d. to 10½d. per lb., less 5%.

ALUMINA SULPHATE unchanged at £7 5s. to £8 5s. for the 17/18% iron free quality.

ARSENIC.—Although the demand has not been for very large quantities the market continues firm due to the absence of supplies of English material. Cornish material is a nominal market at about £20 per ton. Imported material is on offer at about £19 to £19 10s.

CREAM OF TARTAR is rather quiet at about 77s. 6d. per cwt., ex store London.

COPPER SULPHATE steady at about £19 per ton.

FORMALDEHYDE is a little easier at about £27 per ton.

LEAD ACETATE.—£31 5s. per ton for white and £30 15s. per ton for brown with an increasing demand.

LITHOPONE remains unchanged at £18 to £22 per ton, according to grade and quantity.

POTASSIUM BICHROMATE.—Firm at 4¾d. per lb., with the usual discounts for contracts.

POTASSIUM CHLORATE is unchanged and steady at £28 to £32 per ton.

PERMANGANATE OF POTASH.—5¾d. to 5½d. per lb., ex warehouse London, for needle crystals B.P., with a good steady demand.

SODA BICHROMATE firm at 3½d. per lb., with usual discounts for contracts.

SODA HYPOSULPHITE PHOTOGRAPHIC CRYSTALS.—£14 5s. per ton and in good demand, with commercial crystals rather slow at £8 10s. per ton.

SODA PRUSSIATE.—In good steady request at 4½d. to 5¼d. per lb., according to quantity.

TARTAR EMETIC is rather quiet at about 10¼d. per lb.

ZINC SULPHATE.—Unchanged at £10 10s. per ton.

Coal Tar Products

THE market for coal tar products is quiet, and prices are unchanged from last week.

MOTOR BENZOL.—Remains at 1s. 4½d. to 1s. 5½d. per gallon f.o.r.

SOLVENT NAPHTHA is quoted at 1s. 1½d. to 1s. 2d. per gallon f.o.r.

HEAVY NAPHTHA is unchanged at 11d. to 1s. 0½d. per gallon f.o.r.

CREOSOTE OIL is obtainable at about 3d. to 3½d. per gallon f.o.r. in the North, and at about 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Remains at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality, 95/97%.

NAPHTHALENES are unchanged at about £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.

PITCH is quoted at 45s. to 47s. 6d. per ton, f.o.b. East Coast port, for forward delivery.

The following additional prices have been supplied to us :—

Carbolic Acid.—Prices are unchanged; 5-ton lots 5¼d. with druggists' quantities at 6¼d. in bulk packing.

Aspirin.—Is quiet at this season, but prices are steady at 2s. 7d. to 2s. 9d. per lb. for usual quantities.

Phenolphthalein.—The market has been reported to be a little erratic, but schedule prices are unchanged; 5s. per lb. for 10 cwts., 5s. 2½d. per lb. for smaller quantities. There was a rumour that prices had been reduced, but they have not been confirmed.

Methyl Salicylate.—One-ton lots at 1s. 3d., 5 cwts 1s. 3¼d., 1 cwt. 1s. 3½d., smaller quantities 1s. 4d. per lb. These are, of course, in bulk packing.

Cresylic Acid.—Is quiet without any important change to report. Pale, 97/99%, is 1s. 6d. to 1s. 7d., with better grades 99/100% at 1s. 10d. to 2s. High boiling acid is distinctly firm and prices up to 3s. have been paid.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—During the last week considerable offerings were made and the price has receded to about £5 2s. 6d. per ton f.o.b. U.K. ports in single bags. The market is still unsettled and if offerings continue in their present volume a further drop seems likely. *Home.*—In view of the lower prices of this product British producers have announced a reduction of price to £5 10s. delivered to farmer's nearest station in 6-ton lots, up to June 30, 1932. They add that they reserve to themselves the right to reduce or increase the price without notice.

Nitrate of Soda.—No definite announcement has been made concerning the prices for the season 1931/32. In view of the low prices in operation for sulphate, the market is waiting with interest for the new price scale.

Latest Oil Prices

LONDON, August 19.—LINSEED OIL closed firmer. Spot ex mill, £15 5s.; August, £14 7s. 6d.; September-December, £14 15s.; January-April, £15 12s. 6d., naked. RAPE OIL was slow. Crude extracted, £26; technical refined, £27 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian, crude, £18; refined, common edible, £21; deodorised, £23, naked, ex mill. TURPENTINE was quiet. American spot, 47s.; September-December, 35s. per cwt.

HULL.—LINSEED OIL, spot and August, closed at £15 2s. 6d., naked; September-December, at £15 5s.; January-April, at £15 15s. COTTON OIL.—Egyptian, crude, spot, £18 15s.; edible, refined, spot, £20 15s.; technical, spot, £20 15s.; deodorised, £22 15s. PALM KERNEL OIL, crude, naked, f.m.q., spot, £19 10s. GROUNDNUT OIL.—Crushed/extracted, spot, £24 10s.; deodorised, £28 10s. RAPE OIL.—Crushed/extracted, spot, £25 10s.; refined, £27 10s. SOYA OIL.—Crushed/extracted, spot, £17; deodorised, £20 10s., per ton. COD OIL.—17s. per cwt. CASTOR OIL, spot, 40s. 6d.; firsts, 35s. 6d.; seconds, 33s. 6d. per cwt. TURPENTINE.—American, spot, 46s. per cwt.

South Wales By-Products

THERE is very little change in South Wales by-product activities. The pitch demand is small and uncertain, and, as the patent fuel industry is depressed, an improvement is unlikely to materialise for some time. Most pitch business is confined to small parcels for immediate and near-date delivery. There is no change in values. Road tar has a steady, if moderate, call round about 13s. per 40-gallon barrel. Refined tars are a fairly good feature, there being a fair call for coke-oven and gasworks tar. Quotations are unchanged. Naphthas have a quiet market, solvent having a small, but heavy having practically no demand. Values are unchanged. Patent fuel and coke exports are unsatisfactory and no improvement is likely until about middle autumn. Patent fuel prices, for export, are :—19s. 9d., ex-ship Cardiff; 19s. to 19s. 6d., ex-ship Swansea. Coke prices are :—Best foundry, 32s. 6d. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

ROAD work is going on rapidly, resulting in a large prompt demand for refined tar. Distillers are well stocked with cresylics and naphthas and there is no immediate prospect of any increased demand, but creosote oils remain remarkably active.

Cresylic Soap.—Orders are scarce and prices remain easy. Pale 99/100%, 1s. 5d. to 1s. 6d. per gallon; pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 3d. per gallon; f.o.r. naked. High boiling is not plentiful and value is higher at about 2s. 6d. to 3s. per gallon.

Carbolic Sixties.—With no business offering, value is nominal at 1s. 1d. to 1s. 3d. per gallon according to percentage of water.

Creosote Oil.—Production is well looked after and quotations are steady. Specification oils, 2¼d. to 3d. per gallon; washed oil, 3¼d. to 3½d. per gallon; gasworks ordinary, 3½d. to 3¾d. per gallon; all ex makers' works.

Coal Tar Pitch.—The forward position is firmer, but distillers are not anxious sellers owing to the current demand for tar. Value is about 42s. 6d. to 45s. per ton, f.o.b. Glasgow and for export, and about 40s. per ton, ex works, for home trade.

Blast Furnace Pitch.—There is a small but steady demand at 30s. per ton, f.o.r. works for home trade; and 35s. per ton, f.a.s. Glasgow for export.

Refined Coal Tar.—The demand for prompt delivery is large, and quotations are steady at 2½d. to 2¾d. per gallon, f.o.r. in buyers' packages.

Blast Furnace Tar.—Unchanged at 2¾d. per gallon f.o.r.

Crude Naphtha.—Production is low and value remains at 4¼d. to 5¼d. per gallon according to quality.

Water White Products.—Stocks are large and demand is poor. Values are easy. Motor benzole, 1s. 2¼d. to 1s. 3½d. per gallon; 90/160 solvent, 1s. 1½d. to 1s. 2½d. per gallon; and 90/190 heavy solvent, 11½d. to 1s. 0½d. per gallon; all ex works.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, August 18, 1931.

THE Scottish heavy chemical market continues to improve.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £45 to £56 per ton; pure, £35 5s. per ton; technical, 80%, £34 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at 3½d. per lb., ex store. On offer from the Continent at 3¾d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 1s. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 11½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £26 per ton, ex wharf. On offer for shipment from China at about £23 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £23 10s. per ton, ex wharf Spot material still on offer at £24 per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £29 per ton, ex store. Continental on offer at about £27 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £30 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £32 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 2s. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £24 10s. per ton ex store. Offered from the Continent at £23 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¼/100% POWDER.—Quoted £26 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Australian Debt Conversion Act

Position of Invested Trade Funds

THE Department of Overseas Trade announces that from telegraphic advices received from Australia it is understood that under the provisions of the Commonwealth Debt Conversion Act, which was proclaimed to take effect as from August 10, the position appears to be that the holder of investments in internal Australian Commonwealth and State securities, which represent the proceeds of goods exported to Australia and invested temporarily in such securities owing to the difficulty of transfer, has the following alternatives open to him. (Loans raised in London or New York are not affected by the Conversion Act.)

(*a*) He can accept conversion under the general conversion scheme. Special provisions were made for existing tax-free securities. Other converted securities were to be free from State income tax, and certain provisions were made for their exemption from any increase of existing Commonwealth tax. (*b*) If the holder takes no action he will have been held to have agreed to the general conversion proposals. (*c*) He can apply to the Commonwealth Treasurer for special conversion under Section 16 of the Act. (*d*) He can dissent both from the general and special conversion. The position of holders who dissent has not yet been settled.

The final date for notifying particulars and also the desire for special conversion under (*c*) is August 31. Under (*a*), (*b*) and (*d*) the final date for notification for overseas holders is September 21. The question of the maturity dates of the short-term securities into which existing securities representing trade monies may be converted is, it is understood, entirely a matter for the Federal Treasury; the terms cannot be decided until full particulars of the securities it is desired to convert under Section 16 are available to the Treasury. Conversion terms will otherwise conform to the general provisions of the Act, and interest will be subject to the general reduction of 22½ per cent.

Firms desiring to convert their holdings of invested trade monies into the new special short-term securities must notify the Commonwealth Treasurer, Canberra, of their wishes, either by cabling direct or, where agencies exist in Australia, through such agents, not later than August 31. The following particulars are required: Name of firm, nature of business, particulars of securities held, including amount, rate of interest, date of maturity and date of purchase.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, August 20, 1931.

General financial and economic conditions, not to mention holiday influences, are not conducive to any material improvement in trade compared with the volume reported during the past month or so, and this has been the experience of traders on the chemical market here. Actual buying has been very patchy, on the whole, and whilst the general tendency with regard to prices appears to be reasonably steady orders placed this week have, for the most part, been for relatively small quantities for delivery over the next month or so, with hardly sufficient, even of this class of trade, to go round.

Heavy Chemicals

In the case of prussiate of soda values keep firm at from 4¾d. to 5¼d. per lb., according to quantity, with only a moderate demand reported. There has been a comparatively quiet call for chlorate of potash, offers of which are about unchanged on balance at from £26 to £26 10s. per ton. There is a quietly steady call for caustic soda, particularly against contracts, which are quoted at from £12 15s. to £14 per ton, according to grade. Bichromate of soda is steady on the basis of 3½d. per lb., less 1 to 2½ per cent. discount, with buying interest in this material on moderate lines. Both inquiry for and actual business in phosphate of soda have been limited this week, and values seem to be rather easy, with the dibasic quality on offer at about £10 per ton. Bicarbonate of soda is maintained at round £10 10s. per ton, a quietly steady movement of this material being reported here. Offers of alkali are in the neighbourhood of £6 per ton, a moderate business going through. The demand for sulphide of sodium continues on rather narrow lines, but values are more or less where they were a week ago, offers of the 60-65 per cent. concentrated solid quality being at about £9 per ton, and of the commercial kind at £7 15s. Hyposulphite of soda is a relatively quiet section, with offers ranging from £15 to £15 10s. per ton for the photographic quality, and £9 5s. for the commercial. Saltcake is steady at from £2 15s. to £3 per ton, a moderate movement being reported.

Carbonate of potash is meeting with a quiet demand, with current offers at about £24 5s. per ton. Prussiate of potash is well held at from 6¾d. to 7¼d. per lb., according to quantity, for the yellow material. Bichromate of potash meets with some inquiry, and prices are steady at 4¼d. per lb., less 1 to 2½ per cent. discount. Not much business is passing just now in permanganate of potash, offers of which are unchanged at from 5¼d. to 5½d. per lb. for the B.P. product, and round 5d. for the commercial. Caustic potash is in quiet demand at £27 per ton. Sales of chlorate of potash are rather slow, with values at about £27 10s. per ton.

Arsenic continues in short supply, and prices are largely nominal at the higher level of £23 per ton, at the mines, for white powdered Cornish makes. With regard to sulphate of copper, sales are comparatively poor, and at about £18 10s. per ton, f.o.b., the tendency continues easy. Not much demand can be reported in respect of the acetates of lime, with the grey material still on offer at about £12 per ton and the brown at £7 10s. The demand for the lead compounds, also, is quiet, with nitrate at round £28 10s. per ton and white and brown acetates at £32 10s. and £31.

Acids and Tar Products

A moderate trade is passing in the case of acetic acid, which is quoted at £49 per ton for the technical glacial material and £35 for the 80 per cent. commercial. Citric and tartaric acids are easy at 10¾d. to 11d. and 10½d. per lb., and the demand for both is on a restricted scale. Oxalic acid is steady at £1 14s. 6d. per cwt., ex store, but sales this week have been rather quiet.

Pitch maintains its comparatively firm tendency, with offers at from 42s. 6d. to 47s. 6d. per ton, f.o.b. Creosote oil meets with a poor demand, and quotations are no better than 3d. to 4¼d. per gallon, naked, according to grade. Solvent naphtha is easy at about 1s. 1d. per gallon, naked, and the buying movement continues slow. Crystal carbolic is quiet and unchanged at 5d. to 5¼d. per lb., f.o.b., with crude quoted at from 1s. 3d. to 1s. 4d. per gallon, naked.

Company News

John Oakey and Sons.—The directors have declared an interim dividend on the ordinary shares at 2½ per cent., less tax, payable on September 1.

Tarapaca and Tocopilla Nitrate Co., Ltd.—An extraordinary general meeting has been called for October 14, at 2 p.m., at the Chile Office, Calle Anibal Pinto 595, Iquique, to consider a special resolution to change the name of the company to "Taratoco Investment, Ltd."

Eastman Kodak Co. of New Jersey.—The following quarterly dividends have been declared, payable on October 1: Regular dividend of 1¾ per cent. on preferred stock; dividend of $1.25 per share on common stock; and an extra dividend of $0.75 per share on common stock. Similar payments were made in the previous quarter.

Bradford Dyers' Association.—At a meeting of the directors at Bradford on Monday, it was decided not to pay an interim dividend for the year to December 31, 1931, on the ordinary shares. The directors add that as the accounts show that no profit has been made during the half-year to June 30, 1931, the debenture interest and preference dividend paid on July 1 last will have to be provided out of reserves.

Dartmoor China Clay Co.—The report for 1930 shows a profit of £2,123, plus £3,579 brought in; £2,000 has been written off preliminary expenses and £3,702 carried forward. The directors, other than Mr. S. Vivian, who has only drawn a small fee for special work, have completely waived their fees for 1929 and 1930 and onward until such time as the affairs of the company improve. The bank overdraft has been reduced during the year by £2,250, and it has since been further reduced.

International Nickel Co. of Canada.—The statement for the six months ended June 30 last shows that earnings for that period declined from $11,721,189 to $6,486,966, while other income amounted to $79,703, in contrast with $431,619, making a total of $6,566,669, against $12,152,808 for the corresponding period a year ago. Administration and general expenses and provision for taxes absorbed $1,022,193, against $1,723,244, leaving a net operating income of $5,544,476, in contrast with $10,429,563. After deducting interest paid and accrued and provision for depreciation, depletion, and other reserves, the net profit comes out at $3,359,886, against $7,883,874 a year ago. Adding this to the surplus of $20,646,169 at the beginning of the period, the total is $24,006,055, against $32,842,844. Dividends on the preferred stock absorbed $966,967, against $966,952, and on the common stocks $4,373,628, in comparison with $6,877,989, leaving a surplus of $18,665,460, which compares with $24,997,902 at the corresponding date a year ago.

A Notable Advance in Welded Plant

The manufactures of Thompson Bros. (Bilston), Ltd., include a range of mixing pans having stainless steel agitating gear. These pans are steam-jacketed, mounted on legs and provided with a necessary driving gear. They make also a still for distilling essential oils. Here all parts in contact with the liquid and vapour are of stainless steel and the still is provided with sight glasses, temperature tubes, live steam inlets, etc. In addition, various plant units in mild steel, glass-enamel lined mild steel and aluminium are also made. The outstanding feature of this work is that the welds are guaranteed to be (within commercial limits) of the same composition as the material welded, and to be equal in corrosion resistance and strength to the original plate. Thompson Bros. have specialised in welding for many years. An interesting portion of their exhibit is a number of sheets of steel, and other metals, in each of which plant has been made. These metals include the following: Mild steel, aluminium, glass-enamel lined mild steel, ebonite and rubber covered mild steel, stainless steel and monel metal.

A Market for Detergents in Finland

Detergents and cleansing and polishing substances containing soap, fat or oil, imported into Finland in 1930, amounted to 357 metric tons, compared with 166 tons in 1929. Germany was the largest source of supply with 75 per cent. of the total imports, United States 12 per cent., and Sweden 5 per cent.

BROOMWADE

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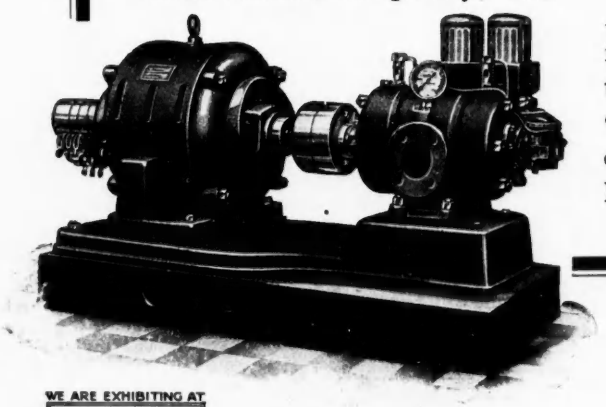
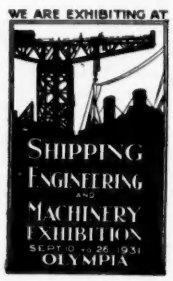
MANUFACTURED in a range of sizes from 6 to 1200 cubic feet per minute capacity, the "Broomwade" Rotary Machine is super-efficient, and its running speed and low starting torque enable it to be direct coupled to comparatively high speed squirrel-cage motors or other forms of driving units.

As a Compressor for pressures from 4 to 40 lbs. per square inch, or as an Exhauster with a vacuum reading within ·23 of the barometer, this machine is pre-eminent in its class, whilst the rugged construction, simplicity, and quality of materials and workmanship are cardinal features which are strikingly apparent to the Plant Engineer.

Among this range there is a machine particularly suitable for your special needs — a machine capable of giving under the most arduous conditions a full measure of efficiency and reliability, and a machine embodying the results of 30 years' exhaustive effort in the design, manufacture and installation of Air Compressing Machinery.

The name "Broomwade" has become the standard by which Air Compressing Machinery is set; that is why Engineers the world over specify "Broomwade" when rigid conditions call only for the Best Possible.





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BROOM & WADE LTD.

HIGH WYCOMBE

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

ITALY.—A firm at Trieste is desirous of obtaining the representation, on a commission basis, of a British manufacturer of ultramarine blue. (Ref. No. 169.)

CANADA.—A firm of manufacturers' agents engaged in the sale of chemicals for the textile industry and the pharmaceutical trade in the Provinces of Quebec, Ontario and Manitoba, desire to secure United Kingdom agencies on a commission or consignment basis for textiles and pharmaceutical chemical specialities. (Ref. No. 159.)

SOUTH AFRICA.—A manufacturers' agent in Johannesburg, who is at present in the United Kingdom, desires to secure the representation of British manufacturers of perfumery. (Ref. No. 161.)

SOUTH AFRICA.—The South African Railways and Harbours Administration is calli g for tenders, to be presented in Johannesburg by September 28, for the supply of 8,730 gallons of raw linseed oil, and 11,760 gallons of boiled linseed oil. (Ref. B.X. 7136.)

BRITISH INDIA.—The Director of Contracts, Army Headquarters, Simla, invites tenders for 600 cwts. glycerine, pure. Forms of tender are obtainable from the Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1, at a fee (which will not be returned) of 5s. Tenders must be sent direct to the Director of Contracts, Army Headquarters, Simla, by registered post, to reach him not later than September 14.

Tariff Changes

POLAND.—A Ministerial Order dated July 21, effective as from July 22, prohibits the import into Poland (except under licence) of nitrate of ammonium tariff No. 98 [4], sulphate of ammonium Tariff No. 98 [5], Chile saltpetre Tariff No. 103 [1], refined and synthetic nitrate of sodium Tariff No. 103 [2], and calcium cyanamide Tariff No. 103 [5].

CANADA.—The following amended Tariff items have been agreed to in Committee :—

	British Preferential Tariff.	General Tariff.
Non-alcoholic preparations or chemicals for disinfecting, dipping or spraying ..	Free	15% *ad val.*
Regenerated cellulose and cellulose acetate and manufactures of regenerated cellulose or of cellulose acetate	20% *ad val.*	35% *ad val.*

The amendment in respect of cellulose and cellulose acetate will only come into force when the Governor-in-Council is satisfied that regenerated cellulose, transparent, in sheets, is being manufactured in Canada in quantity and quality sufficient for Canadian requirements, regenerated cellulose and cellulose acetate, transparent, in sheets, at present being duty-free in the case of the British Preferential Tariff while bearing a duty of 10 per cent. *ad val.* in the case of the General Tariff.

Renewed Negotiations for Nitrate Cartel

IT is expected that negotiations will be reopened for the formation of a nitrate cartel to include Europe and Chile, as the leading personalities of the nitrate world are now gathering at Brussels. It will be recalled that towards the end of June negotiations were in progress for the formation of a cartel as from July 1 in continuance of the existing cartel, which included Chile, Imperial Chemical Industries, and I.G. Farbenindustrie.

As there was a failure to agree, however, the effective date was postponed until July 15, when negotiations again broke down. Since then Chile has reduced her prices, but it is not known whether there is any connection between this new move and the present gathering.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

BITUMINOUS COMPOSITIONS, LTD. (late BITUMINOUS COMPOSITIONS (1929), LTD., Grimsby. (M., 22/8/31.) Registered August 5, debenture, to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; general charge. *——. December 26, 1930.

FIRTH (THOS.) AND JOHN BROWN, LTD. (late THOS. FIRTH AND SONS, LTD.), Sheffield, steel manufacturers. (M., 22/8/31.) Registered August 7, £600,000 charge (sec. 81, 1929 Act), to Baron Aberconway and others; charged on properties at Sheffield. *£400,000. June 15, 1931.

Satisfaction

SILICATE CO., LTD., Hemel Hempstead. (M.S., 22/8/31.) Satisfaction registered October 5, £500, registered June 24, 1901, and July 31, 1931.

London Gazette, &c.

Company Winding Up Voluntarily

ELECTRO BLEACH AND BY-PRODUCTS, LTD. (C.W.U.V., 22/8/31.) Creditors' claims to J. K. Batty and D. Drummond, Winnington Works, Northwich, liquidators of the company, by September 30.

New Companies Registered

CHEMICAL TRUST OF GREAT BRITAIN, LTD., Victoria House, Southampton Row, London, W.C.1. Registered as a private company on August 17. Nominal capital £100 in £1 shares. The objects are to carry on the business of promoters of companies, financiers, concessionaires, contractors for public and other works, merchants and traders, etc. A subscriber: F. M. Brister, 12, The Valley Green, Welwyn Garden City, Herts.

INSTITUTE OF THE PLASTICS INDUSTRY, LTD., 104, High Holborn, London, W.C.1. Registereed August 13, as a company limited by guarantee, without share capital, with 500 members, each liable for £1 in the event of winding up. To promote the cause of the plastics and allied industries of Great Britain. The management is vested in a council. Directors: C. Chapman, C. S. Dingley, W. L. Edward, W. Owen-Griffiths, R. Jones, C. C. Last, P. G. Rudd, A. W. Sherwood, J. Taylor.

KORER PRODUCTS, LTD.—Registered August 17. Nominal capital £700 in 500 10 per cent. cumulative preference shares of £1 and 4,000 ordinary shares of 1s. each. Manufacturers of an dealers in chemical compounds, and other solid and liquid compounds and products for the preservation of rubber and other non-metallic tubings, coverings and products, etc. Directors: J. Korer, "Netta," Stedhow Park Drive, Leeds; Mrs. D. Korer, J. R. Meikle.

Revision of Cosach Law Rumoured

IT was reported that the Chilean Chamber of Deputies has voted in favour of a revision of the Law under which the Compania de Salitre de Chile (Cosach) was formed, in 1930, but so far official confirmation of this report has not been received either by the Chilean Government's representatives in this country or by banks most closely in touch with Chilean affairs. Independently of whether this particular report be true, it seems evident that there is a considerable agitation in Chile and in Paris against some of the regulations in the Cosach law itself, and against certain decrees promulgated under the late Government but never ratified by the Chamber.